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New York Medical Journal
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Philadelphia Medical Journal and the Medical News

A SEMIMONTHLY REVIEW OF MEDICINE AND SURGERY

EDITED BY
GREGORY STRAGNELL, M. D.

VOLUME CXVIII

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Physiotherapy*

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New York.

Most papers dealing with physiotherapy that are presented to the general surgeons and medical men, are so restricted to a presupposed knowledge of physiotherapy, that it will be the effort of the writer to present physiotherapy for your consideration in the light of physics and physiology. I shall endeavor to show wherein physiotherapy is really a help to established surgical and medical procedures. There are many men who do this work who refuse to acknowledge that physiotherapy is mainly an aid in treatment, and endeavor to show where they can compete with established practices which are certainly more accepted by the medical profession as a whole.

Of course the older workers in physiotherapy have endeavored so much to treat every condition by these measures, that they frequently neglect due consideration of established surgical and medical practices. We younger men in this field, who are more trained in modern surgery and medicine, realize that our first duty is to use accepted operating room, laboratory, and ward treatments, and then, if possible, help out these procedures with physical measures.

The basis on which physiotherapy is applied is with the consideration that disease is an abnormal condition of the body which is acute in its course, if the reaction of the body to this disease is adequate. If, however, the reaction is inadequate, the disease continues, eventually becoming chronic. The use of physiotherapy in the treatment of disease is along the lines of an effort to convert this inadequate reaction into an adequate reaction. So with an understanding of the pathology encountered, the application of physical measures is indicated, if, through the physiological response, the inadequate reaction can be converted into an adequate reaction. It is often astonishing to patients who desire a prognosis of their condition to tell them that such cannot easily be given because it all depends upon how they themselves respond to the treatment.

Physiotherapy is a word coined by the army which includes treatment by all physical measures. The special divisions of physiotherapy are: electrotherapy, phototherapy, thermotherapy, hydrotherapy, actinotherapy, röntgenotherapy, massage, and exercise.

ELECTROTHERAPY.

Electrotherapy is the use of electricity in one of its many forms, and I shall present a brief description of these forms with their methods of inducing results.

1. *Galvanic electricity.*—This, the earliest form known, is a current flowing in one direction with a definite positive and negative pole. The action of this current is purely chemical, and it is used where ionization is required for the induction of chemicals into tissue. The positive pole has analgesic, hemostatic, and antiseptic actions, and repels bases, metals, and alkaloids. The negative pole is the opposite of the positive in the characteristics mentioned and repels acid and acid radicals. The negative pole has also the ability to soften scar tissue, and is frequently used to loosen adherent scars. Galvanism is also used in removing hair but this is a very delicate procedure. The negative galvanic current has been used extensively by some men to destroy urethral strictures.

2. *Faradic current.*—The faradic current is a pure, induced current (having no positive nor negative pole), and its greatest use is to produce exercise of muscles through the stimulation of the motor end plates in the muscles.

Both faradic and galvanic currents are applied with machines which cause variations in their strength, and these currents of varying strength, such as the sinusoidal current, have special uses.

3. *High frequency currents.*—These currents also have no definite positive or negative pole because they are of an alternating character and of such great frequency in alternation that the entire effect of these currents is due to their ability to generate heat when passing through a resistance, such as the body. There are two high frequency currents which are in general use—the d'Arsonval current applied with two electrodes, and the Oudin current applied with a single electrode. The d'Arsonval cur-

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rent is mainly used in two ways—for autocondensation and diathermy. Autocondensation is applied by the patient holding one pole in his hands placed on a cushion, the other pole being connected with metal plates on the opposite side of a cushion upon which the patient is seated or reclining. The cushion is a special nonconductor, and when the current is applied, the effort of the current to penetrate this nonconductor condenses the current in the patient and generates heat. This heat gives an actual rise in body temperature, whipping up all the processes of the body, and it has been found that blood pressure may be most satisfactorily reduced with this treatment. Investigations have shown that there is an increase in the expired carbon dioxide and in the specific gravity of the urine passed after a treatment. As an example of what autocondensation will do in the treatment of high blood pressure, I have looked over the records of about twenty-five cases and found that my maximum reduction has been fifty-two mm. and of course my minimum has been zero, and disregarding these negative reactions, my average drop in all cases has been fourteen mm. in each treatment. It is necessary to ascertain the correct dosage for each patient before results show during the course of treatments, and I have found that in forty-eight hours a patient's blood pressure will not rise more than thirty-five per cent. to forty per cent. of the amount which had been reduced.

The second way of using d'Arsonval current, called diathermy, is by the application of this bipolar current with two electrodes placed on opposite sides of the part in which one wishes to generate heat, and the current passsed directly through this part. It has been proved many times that the current is first generated in a spot equally distant between two electrodes of the same size, and then in the tissue the heat spreads from the centre out towards the electrodes. If the electrodes are of different sizes, the centre of heat generation varies in proportion to the square of the electrodes. This makes it possible to place a large electrode on one part of the body, and by use of a very small electrode such as a needle, apply diathermy in what the English call a surgical way for the destruction of tissue beneath the needle point. I have seen cases where the entire jaw and teeth have been destroyed by this means. In the use of what the English call medical diathermy, the electrodes are generally kept about the same size and this current is used with good results in joints and through the chest in bronchitis and even in pneumonia to increase the circulation by the generation of heat. In the past two years, diathermy has been used in cases of postapoplectic paralysis with an electrode on the forehead and one on the occiput to whip up the circulation within the brain itself and hasten the absorption of the clot. This heating of the brain has been proved by experiments on the heads of decapitated criminals where the brain has been actually cooked within the skull.

The Oudin ccurrent applied with one pole is used mainly in the destruction of surface growths and is successful in the treatment of epitheliomata above the mouth, and of warts and moles.

The fourth electrical modality used is the static current. This is extremely useful because it is of high voltage and low amperage, and has a definite positive and negative pole of which the positive is the most useful and analgesic, whereas the negative is very irritating. Perhaps a description of the difference between a static current and an ordinary high voltage current, such as that used in the x ray, will emphasize the fact that static electricity is purely mechanical in its effect. High voltage and low amperage mean great force with small volume, such as the shooting of a small dried pea in a ten inch mortar; the force of the explosion being the voltage and the pea being the amperage. If the ten inch shell is put in the mortar, the amperage is increased, and hence the effect of the current with the same force is much greater. So you see that static electricity is force under great pressure but of small volume, and people are amazed that they can stand five hundred thousand volts of this current without any detrimental effects.

There are three main ways of applying the static current, the exact description of which I shall not go into, except to call them the static wave current; where the patient is connected with only the positive pole and the current goes into but not through the patient, making the patient the condenser; the static sparks which are applied by grounding the current in the patient who is connected in the same way to the machine; and the static brush discharge is also used which has a pronounced sedative action and is useful in painful conditions where one wishes to use static electricity for its mechanical effect. The difference in technic in giving this treatment is that the patient is connected with the negative pole of the machine, the positive pole of which is grounded, and then from another lead from the earth, the positive current is conducted to the patient through a special applicator which causes it to go through the air as a brushlike effluve. This brush discharge in going through the air generates ozone and incidentally has been found successful in the treatment of styes.

I hope that this brief consideration of the uses of electricity will be sufficient to show you that with electricity we have, first a chemical means, one inducing exercise, one generating heat within the tissues, and a fourth which has a purely mechanical current far surpassing any effects which can be obtained by massage. For electricity makes the part work instead of working the part.

PHOTOTHERAPY.

As the name implies, photography is treatment by light. To understand the way in which light works, it is necessary to remember the old law, you all learned in physics, of the conservation of energy, and to realize that light energy when stopped becomes heat. It is also necessary to realize that light cannot be appreciated by the eye until it is stopped. Therefore if light penetrates through a tissue and we can see light on the other side of this tissue, we know it has penetrated through to the depth we see it. Consequently the light rays being stopped at this depth, generate heat there. Experiments have shown that it is very easy to expose films placed within the abdominal cavity and thorax by a shining light on the outer side of the abdomen or chest. So we know that in applying light to a muscle the light penetrates into the substance of the muscle and generates heat within the muscle itself. This is why counterirritation with light so far surpasses counterirritation by any other means, such as mustard paste, flaxseed poultices, or actual cautery. In treating with light there is also the effect of radiant heat. This is best exemplified in the warmth given off by these popular electric heaters with copper reflectors, and also directly by the sun. If the heat given off was the same as that given by a nonglowing source, the heat rays could be deflected by an electric fan or strong draught of air. We all know that if the sun is shining directly on snow it will melt, whereas two inches away in the shade the snow will not melt. The phenomenon is due to the effects of radiant heat which when used on patients does all that poultices, and other remedies do. Phototherapy is only used for the heat effect, and generally to increase the local circulation before the application of other measures, such as static electricity.

THERMOTHERAPY.

This is the use of dry heat in small electric bakers or large bakers in which the entire body is inserted. The action of dry heat and also vapor baths (which are moist heat) is to induce perspiration by surrounding the body with air of an increased temperature. It is my belief that electric light baths, due to the generation of heat within the tissues as well as the application of radiant heat upon the surface, are much more efficient than hot air or vapor baths.

ACTINOTHERAPY.

Actinotherapy is treatment with ultraviolet light. This light is purely germicidal in its effect, but lately it has been found that there is a distinct tonic effect in baths given with this light. Ultraviolet light is that part of sunlight which causes tanning of the skin, and it is very essential to realize that it will not pass through ordinary glass. The only available conductor of ultraviolet energy is pure quartz or the air. The ultraviolet light we have at our disposal is more efficient than the best sunlight obtainable on the earth's surface, because the wave lengths produced are shorter than the shortest rays of the sun. The unit of wave measurement is called an Angström unit. This is a wave length of one micron. The shortest waves from the sun are 2910 Angström units, whereas we can get from our quartz lamps wave lengths of 1850 Angström units, and it is much easier to blister a patient with ultraviolet light than with the actual sunlight. If, however, a patient is blistered there is no actual destruction of the deeper epithelium, and skin much smoother will grow where the blister has been induced. Realizing this advantage of ultraviolet light, wherever we have superficial infections of the skin or conditions of subacute infections of wounds, ultraviolet light is a distinct aid in the treatment of these infections.

There are two forms of quartz burners used for the generation of ultraviolet light—the aircooled which is a Cooper Hewitt mercury lamp, the tube of which is fused quartz; and a watercooled lamp in which the tube is surrounded by circulating cold water so that the heat from the boiling mercury is taken away and the lamp can be used closer to the skin or with quartz applicators attached to the front of it, applied to cavities or sinuses. The aircooled lamp has practically no further penetration than a millimetre but the watercooled lamp penetrates about one tenth of an inch, and if the applicator is pressed upon the skin, can be made to penetrate about one quarter inch. I have seen truly remarkable results in cutaneous infections (especially in furuncles before the formation of pus) achieved by the use of ultraviolet light. I might also mention that Major C. M. Sampson of the Public Health Service last year attained honorable mention in the Leonard Research Prize Contest of the American Röntgen Ray Society for his work in using ultraviolet light to increase gradually the skin resistance to x ray. He was able to give doses of x ray without disastrous results which, I am sure, most x ray men consider unbelievable. Major Sampson has also been universally successful in the treatment of x ray burns with ultraviolet light, and this field promises a future which will undoubtedly aid x ray therapy in years to come.

HYDROTHERAPY.

Hydrotherapy is superficial in its direct action, but indirectly we have a means to produce a sedative or an intensely stimulating secondary reaction in the body or on parts to which it is applied. The use of the whirlpool baths where the water is kept constantly agitated by means of air, was found in the army to be the greatest help in the treatment of injured peripheral nerves and stumps after amputation.

X RAY.

The subject of x ray therapy is making so many advances from day to day and so many just and unjust claims are being made for it, that I feel that merely a brief mention of its indications are all I should discuss in this paper which is on physiotherapy. X ray therapy is a part of physiotherapy but demands such extensive investigation and exclusive attention, due to the broadness of its field, that a detailed discussion should always be taken up in a paper devoted to that subject by itself. Undoubtedly the x ray is a marvelous aid in therapeutics. It has been supposed that it would supplant many surgical procedures, but it is mainly pushed by the army of enthusiasts who believe they have found something to supplant good old surgery. Undoubtedly the action of the x ray on tuberculous glands is the procedure of choice because of the difference in cosmetic results. This is one of the oldest things that has been treated with x ray, and when first brought out, was laughed at by many surgeons. I remember my father reported fifty cases successfully treated in 1905, and was credited with being the author of great amusement rather than progress. He noted then that the tonsils in these cases were all affected by the x ray, and lately a wave of enthusiasm among some x ray men has pushed the discussion of the effect of the x ray on tonsils to almost a bitter fight. I, personally, believe that the treatment of tonsils with x ray is only indicated where operation is contraindicated. As I have said, this is merely my personal opinion. The preoperative and postoperative treatment of malignant growths is a method to be most heartily endorsed, and I am sure will be more adopted as time goes on. With these brief words to you about the great subject of x ray therapy, I wish to close with an apology to the serious workers in this field for not giving it more complete discussion.

MASSAGE.

Massage is probably one of the oldest forms of physiotherapy, and it has its distinct field in its application to patients who are confined in bed or in a hospital. It also is of use in paralyses and muscular atrophies. Of course there are many ambulatory patients with affected extremities where long continued massage is of distinct help. I do feel, however, that in acute conditions, electricity will produce better and quicker results than massage, for as I said above, electricity makes the part work.

EXERCISE.

Exercise in the treatment of some conditions has made a distinct field for itself. It includes the use of parts of the body which have been limited in their motion, generally through result of some infection or as happened in the war through injuries acquired in the wounded. The different exercises given to men with ankylosed joints and contracted scars helped them in time to acquire remarkable increase in function. It has also been found in the treatment of flat foot that walking on a path of a double inclined plane helped to strengthen the feet and acquire better support. This field belongs more to physiotherapy as applied to orthopedics, and, as in most orthopedic procedures, the results obtained are generally good but take time to achieve. There are exercises used in the reeducation of muscles in paralytics and tabetics and which are of some help, of course with other treatments, and under the head of exercise it was found that boxing and dancing had their place in the big hospitals of the army.

CONCLUSION.

I hope that I have not made the subject of physiotherapy seem to be the least bit mysterious, and that I have been in some way able to show that we who practice physiotherapy want to help both the surgeon and the physician in any way that we can. Physiotherapy is really an aid in established practice, and though there are a few things we can do quicker than with the ordinary surgical or medical procedures, we younger men in this work are most sincere in our desire to cooperate rather than to supersede in the treatment of patients who come to us.

100 EAST FIFTY-FIFTH STREET.

Physical Therapy

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Notwithstanding the fact that we are emerging from a cycle of therapeutic nihilism, it requires some temerity to present a paper on physical therapeutics.

The suggestive effect of the various electric machines emitting weird lights and startling sparks, was readily made use of by shrewd charlatans to extort money from their credulous victims. The semiquacks within the medical profession also exploited the various methods of physical therapy to the extent that the honest physician became unduly prejudiced against all forms of electrical and mechanical methods of treatment.

The profession is beginning to inquire just what type of cases may be benefited by the various electrical, mechanical and phototherapeutic methods of treatment. No little surprise and chagrin are manifested when a trusted patient reports that he has been cured by an osteopath, a chiropractor or an advertising quack who makes use of physical methods of treatment. Many reputable physicians refer their patients to osteopaths, the barber who installs electrical equipment, or the hospital technician, rather than perfect themselves in these methods of treatment or to confer with their confrères who have diligently sought to sift the few grains of truth from the great bulk of chaff regarding the effects of these natural methods made use of in medicine and surgery.

PHOTOTHERAPY

Light exercises a stimulating influence on the functions of tissue elements and organs. The energy infused into the body by light is transformed into a stimulus quickening all vital processes. Light influences directly the protoplasm of the irradiated cell, or, by its indirect action through the sense organs and nerves stimulates certain functions of the various organs.

Light falling upon and irradiating the body will either be absorbed producing chemical effects, or, it will be converted into heat increasing absorption phenomenon, or give rise to electrical phenomena, setting up electric currents within the tissues. These processes are frequently simultaneous and it is difficult to separate the effects of the different rays of the spectrum.

DeParville's experiments seem to prove that the red end of the spectrum is nerve irritating and that the reverse, blue and violet are nerve sedative. The bactericidal effect of light is well established and familiar to all. It has been definitely proved that the germicidal action of light is due almost entirely to the blue violet and ultraviolet radiations. The effect of light upon the skin is well known. It produces a specific dermatitis and characteristic tanning.

It has been demonstrated by means of especially prepared photographic plates that red, green, blue, and perhaps, blue violet radiations have the power to penetrate living tissue. The greater portion of the ultraviolet radiations are absorbed by the skin. In this process of absorption, however, powerful chemical changes are induced. Of great importance in this connection is the effect of these absorbed radiations upon the blood. Hemoglobin is the constituent of the blood that uniformly absorbs light. Quincke demonstrated that hemoglobin gave of its oxygen more readily in light than in darkness; thus demonstrating that light increases the oxygenating power of the blood and consequently the processes of oxidation of the body. It will be seen, therefore, that there is a rational basis for the therapeutic application of light.

In utilizing light as a therapeutic agent we may employ direct sunlight, the arc light, or better still, the mercury vapor quartz light and the incandescent lamp. Sunlight in our climate is very uncertain and can be but little utilized. In the sunlight that reaches us most of the ultraviolet radiations have been absorbed by the dust. The therapeutic effect of sunlight is therefore dependent upon the blue violet and less refrangible rays of the spectrum. The arc light or better still the mercury vapor light is far more satisfactory.

The work of Finsen in the treatment of lupus by means of reflected sunlight and later by a powerful arc light was the greatest contribution to scientific phototherapy. Finsen demonstrated the potency of light in the treatment of lupus and placed light therapy upon a rational basis.

Rollier's observations upon the treatment of tuberculosis by means of heliotherapy are of the greatest importance. Rollier affirms that sunlight exercises a powerful action on the nourishment of living structure and that as certain of the spectral radiations penetrate into the depths of the organism, or, as the other more refrangible radiations are absorbed in their passage and converted into other forms of energy, that they bring about an increased metabolism of all tissues. The action is simultaneously bactericidal, oxidizing, pain relieving, granulating and tissue modifying.

The therapeutic effect of the incandescent lamp is largely due to radiant heat. Few violet and no ultraviolet radiations pass through the glass walls of the lamp. The favorable effect of this form of light in the treatment of infective processes of internal organs must be due to the stimulating action of these radiations upon metabolism and in increasing phagocytosis. I have found the high candlepower incandescent lamp of value in the treatment of acute painful conditions such as neuritis, acute bursitis, irritable spine, acute inflammatory joint affections and in hastening the absorption of serous exudates in joints and in pleural and peritoneal cavities.

I recall a case of persistent trifacial neuralgia that had resisted all methods of treatment that was readily cured by means of a 60 watt blue incandescent light bulb. I have found this treatment also of value in the management of superficial inflammations and suppuration. A case of suppurating tuberculous gland was quickly cured by means of a high power electric lamp.

Rollier found sunlight of value in the treatment of all forms of tuberculosis, but more especially in the management of tuberculous arthritis, peritonitis, and urinary tuberculosis. It has been found that the work done by Rollier with mountain sunlight may be accomplished more quickly by means of the mercury vapor quartz lamp.

The work of Alfred Hess and his coworkers has demonstrated the value of light in the treatment of rickets. In this work sunlight was first employed with gratifying results. As unfiltered sunlight is difficult to obtain in all locations, the mercury vapor and arc light were substituted with more uniform results.

Phototherapy has proved valuable in the treatment of certain skin affections. In the management of lupus and port wine marks the water cooled mercury vapor lamp is of great value.

I have successfully treated chronic dry eczema and acne vulgaris by means of a high power incandescent lamp. I have recently treated three cases of pruritis vulvæ by means of a mercury vapor quartz lamp. One of these patients was quickly relieved, another was somewhat benefited, while the third patient showed no perceptible improvement.

The mercury vapor lamp is being employed in the treatment of malnutrition and the simple anemias, the basis for its use being that the hemoglobin absorbs oxygen and imparts it more readily to the bodily structures under ultraviolet irradiation. I have six such cases now under observation, but it is too early to report results.

MECHANICAL VIBRATION

Kellogg says: The spine may be likened to a harp with a thousand strings. By the accurate manipulation of certain spinal areas, the function and metabolism of distant viscera in neural connection with the spinal segment over which the stimulation is applied may be modified at will.

If vibratory stimulation is applied over the posterior branch of a spinal nerve the stimulus is imparted to the sympathetic ganglia with which it is connected, which, in turn, conveys the stimulus or inhibition to the distant viscera it controls, thereby modifying its function.

While the medulla is the chief vasomotor centre, there are also subsidiary centres located at various levels of the spinal cord. The gray rami communicantes pass from the sympathetic ganglia to the spinal nerves and are distributed with them to the skin and bloodvessels.

By means of mechanical vibration, manipulation, or other physical agents, it is possible through this neural mechanism to modify the function of distant structures and viscera. It is well known that the irritation and hyperemia resulting from a gastric ulcer may cause pain, tenderness and muscular spasm in the lower dorsal region. By means of vibration we not only relax local spasm, but by so doing we relieve local stasis and pressure upon the posterior spinal nerve terminals. By relieving local muscular spasm, stasis and pressure, we also modify the circulation, innervation and metabolism of the organ supplied by the communicating branch of the spinal nerve.

Herein lies the danger of this system of therapy. While innervation, function and metabolism may be somewhat modified by means of spinal manipulation, we would not expect it to effect a cure of gastric or duodenal ulcer. It will, however, relieve gastrospasm and the pain resulting from peptic ulcer. It is upon this principle that such cults as osteopathy and chiropractic are based. These practitioners claim to discover subluxations and deviations of the spinal alignment that encroach upon adjacent structures thereby impinging upon the posterior spinal nerve terminals that cause disturbances in remote organs. Repeated x ray examinations have convinced me that such subluxations and malalignments are mostly myths. The apparent abnormality is almost always the result of muscular spasm. Subluxations of the various vertebræ are, however, possible and occur more frequently than has hitherto been recognized.

Various vasomotor centres are situated at different levels of the spinal cord, those controlling the head being between the 2nd and 6th cervical vertebræ. Deep pressure over this area will many times relieve cerebral congestion and hyperemia of the nasal and pharyngeal mucosa. The systolic blood pressure may be lowered by deep vibration on either side of the interspace between the 7th cervical and 1st dorsal vertebræ. I have seen, by means of the fluorescent screen, a sluggish ptosed hypotonic stomach contract vigorously when vibratory stimulation was applied on either side of spine between the 3rd and 5th dorsal vertebræ. Recently I studied such a case, that of a long stretched stomach with no apparent tone and deficient peristalsis. This stomach was located in the vertical position, the lower border of its greater curvature being below the crest of the ilium in the prone position. Vibratory stimulation was applied on either side of the 3rd, 4th and 5th dorsal vertebræ. The stomach was observed during this process by an assistant holding the fluorescent screen. Within a few seconds after the application of the vibration the stomach seemed to manifest tone. A deep peristaltic wave was seen. The stomach contracted and assumed an oblique position. The stomach was further observed for a few moments and its tone and peristalsis continued. Deep and longer continued pressure was then applied over the same area, with the idea of inducing inhibition. Under this vibration the stomach seemed to lose its tone. Peristalsis became more feeble and in a few seconds the stomach dropped back into its vertical position. This would seem to demonstrate the double effect that may be induced by vibration; a light stroke causing vasomotor stimulation while a longer stroke with deeper pressure induces inhibition.

Ocular muscular imbalance, cerebral or meningeal hyperemia, inflammatory processes involving the nasal and pharyngeal mucous membrane may induce contraction and rigidity of musculature of the suboccipital triangle. Deep vibration with sufficient pressure and length of stroke, applied on either side of the interspace between the spinous processes of the 2nd, 3rd and 4th cervical vertebræ, will many times relieve a hyperemia of the nasal and pharyngeal mucous membrane and cerebral hyperemia.

I remember a case of hiccough that occurred in my practice that resisted all methods of treatment. The situation at last became desperate. Finally, deep pressure was made along the anterior border of the scalenus anticus muscle to inhibit the phrenic nerve. This manipulation quickly arrested the hiccough. It returned, however, and the procedure had to be repeated. Each paroxysm became less alarming and it was finally controlled by this method.

The pulse beat may be slowed by vibration over the suboccipital triangle. It may be accelerated by vibration over the side of the 2nd, 3rd and 4th dorsal vertebræ. The vasomotor sensory centre is located between the 4th and 5th dorsal vertebræ. I once relieved a severe attack of angina by deep manipulation and pressure over this area. The pulmonary vasomotor control centre is said to be located between the 1st and 7th dorsal vertebræ. The liver and spleen receive their sensory and vasomotor innervation from the 8th, 9th and 10th dorsal nerves. The liver may be influenced by vibration between the 10th and 11th dorsal vertebræ, the ovaries between the 11th and 12th dorsal vertebræ. The kidneys between the 12th dorsal and 1st lumbar vertebræ. I have upon three occasions fluoroscopically observed a mass peristalsis of the colon take place after vibratory stimulation of both sides of the first, second and third lumbar vertebræ. This phenomenon, however, is not constant and it would require repeated observations to demonstrate that the occurrence as observed was the result of the vibratory stimulation.

From the foregoing it will be seen that vibratory stimulation or inhibition applied over the posterior branches of the spinal nerves will, through their ganglionic connection with structures and viscera, produce marked functional and metabolic reactions. My experience has taught me that it is in functional abnormalities that this method is of the greatest value.

The danger of this system of therapy lies in the ignorance of the cults who practise it in attempting not only to treat all manner of ailments by this method, but also, in basing a system of diagnosis upon apparent spinal abnormalities.

ELECTRICITY

While each of the various forms of electrical energy made use of in medicine produces its own characteristic physiological effect, the action upon general metabolism is similar. The static wave current applied over the hepatic area, the constant current with large electrodes placed over the abdomen and back, the sinusoidal, the faradic, and the high frequency currents cause an increase in the urinary solids, an increase in the elimination of urea and creatinin and an increase of sulphur and nitrogen.

The physiological action of static electricity is due, it is thought, to its penetrating vibratory effects, and is largely mechanical. It modifies arterial tension, lessens the heart's frequency, lengthens its diastole, and increases the pulse volume. It increases the depth of respiration and causes an increased elimination of carbonic acid. It relieves muscular irritability and induces a soporific effect. It induces diuresis and diaphoresis and increases the elimination of urea. The static breeze current is valuable in the treatment of insomnia, especially if accompanied by an irritable spine. The static wave current is valuable in the treatment of local stasis and sprains. Acute bursitis and some forms of neuritis are also benefited by this treatment. This current is also of value in the treatment of sciatica and sacroiliac strain.

The action of the direct or galvanic current is largely chemical and electrolytic. Ionization is the transmission of the constant current by the ions already existing in the tissues of the body. This ionic interchange within the deeper structures induces complex chemical changes that stimulate metabolism. In the passage of this current through the body resistance is encountered that converts electrical energy into heat, that likewise stimulates metabolism. The constant current induces distinct polar effects. An acid reaction is present at the positive pole, while an alkaline reaction characterizes the negative terminal. The positive pole is sedative while the negative is stimulating. The positive is styptic, arresting hemorrhage, while the negative softens cicatrices and dilates constricted orifices. The constant current stimulates and induces contraction of muscles. In the normal reaction the negative is more stimulating than the positive pole and causes a more vigorous contraction of a normal muscle when applied to its motor point. In certain pathological conditions the formula is reversed and the muscle responds more vigorously to the positive electrode. This is the well known phenomenon of the reaction of degeneration. The constant current also stimulates the vasomotor nerves.

Personally, I have employed the constant current in muscle testing and in the treatment of neuritis of the socalled idiopathic type where no apparent focal infection was found. In the treatment of peripheral paralysis the constant current is the most useful form of electrical energy. It should always be used when the paralyzed muscles fail to respond to the faradic current. The electrical treatment of peripheral paralysis should always be directed by a competent physician and only when a careful reaction test has been made.

Electrolysis is perhaps the most satisfactory treatment for the removal of moles, warts and nevi. Formerly I found the constant current of great value in the treatment of arthritis; especially the hypertrophic variety. Since the advent of diathermia I have largely abandoned this method as the direct high frequency current is more efficacious in the treatment of this condition.

The faradic current is utilized in muscle testing and in the treatment of peripheral paralysis. This current is also of value in the management of sensory disturbances such as anesthesia and acroparesthesia.

The sinusoidal current is peculiar from the fact that it is a sine wave that gradually increases from zero to its highest peak of intensity, from which it again recedes back to zero. It causes powerful and painless contraction of muscles both voluntary and involuntary. It stimulates metabolism as a result of powerful group contraction of muscles. The sinusoidal has largely superseded the faradic current as the physiological action of the two forms of electrical energy is similar. It may be employed in muscle testing and in all conditions where the faradic current has been found of value. This current is useful in the treatment of muscle spasm, paresthesia and for the stimulation of paralyzed muscles. The rapid sinusoidal current has given me great satisfaction in the treatment of amenorrhea. The active electrode may be inserted in either the vagina or rectum and a large dispersing electrode applied over the abdomen. I find records of six such cases treated successfully by this method.

The slow sinusoidal current is the most valuable in the treatment of muscular atony. It is of especial service in the management of abdominal ptosis. By means of the powerful and painless muscular contractions that it induces, stagnant blood may be expressed from muscles and viscera and an improved circulation and innervation are established. The abdominal muscles are developed and strengthened together with improved gastrointestinal function.

Space will permit of but a brief résumé of the most valuable of all electrical modalities made use of in medicine, viz., the high frequency current. What is known as a high frequency current is a form of electrical energy having a voltage of from 6,000 to 100,000 volts. It is an oscillatory current that changes its polarity from 800 volts to 1,000 alternations a second. When these currents of high voltage and frequency pass through living tissue a tremendous resistance is encountered and the greater portion of the electrical energy is converted into heat. It is thought that the therapeutic effect of these currents is due largely to this penetrating heat or what is known as diathermia. By means of diathermia we are able to raise the temperature of the whole or any portion of the body. Ordinary heat such as fomentations, dry heat and electric pads when applied to the body is mostly absorbed by the skin and superficial tissues. Little penetrates to the deeper structures.

If the two electrodes of a diathermic apparatus are applied to either side of an egg, it will be found, if sufficient current is employed, that coagulation will first begin at the centre of the egg.

The physiological effect of diathermia is then largely due to the effect of this heat directly transmitted to the deeper structures of the body. It stimulates the vasomotor mechanism inducing a hyperemia. As a result, spasm and congestion are relieved, circulation improved, tissue changes rendered more active, and a more normal metabolism established. An active leucocytosis is induced by means of which local infections are combated. From this résumé of its physiological action we would expect this method of treatment to be of value in the treatment of arthritis. I have found it beneficial in the management of acute infective, arthritis, synovitis, sprains and contusions, and of great palliative value in the treatment of hypertrophic arthritis. In acute sacroiliac strain and trauma about the fifth lumbar vertebra it is of the greatest value. Sciatica as the result of sacroiliac strain and of the socalled idiopathic variety, has almost invariably responded to this treatment. Some cases of bursitis have yielded to diathermia, but in the treatment of this affection I have found that the high candlepower radiant heat lamp followed by the ultraviolet quartz lamp to be of greater value.

In selected cases, diathermia may be of benefit in the treatment of neuritis. Many times after the focal infection responsible for the neuritis has been removed, the pain persists. In this class of cases diathermia preceded by radiant heat will almost always effect a cure. In pelvic congestion and dysmenorrheas diathermia is of great value. I have treated several cases of socalled chronic appendicitis with fixation of the cecum by this method. The result was in some instances gratifying. Repeated fluoroscopic examinations in three cases of this type demonstrated a marked increased mobility of the cecum.

I have found this method of value also in at least symptomatically relieving patients suffering from adhesions about the pylorus and gallbladder.

After twenty years' experience in the treatment of arterial hypertension by means of high frequency currents, I am convinced that it is the safest and most efficient therapeutic method in our possession. We recognize that arterial hypertension is but a manifestation of some underlying cause such as nephritis, syphilis or an endocrine disturbance. Diathermia will not cure nephritis, or syphilis, but it will improve metabolism and modify the vasomotor control of bloodvessels. I have found this method of the greatest value in the management of vascular hypertension so often present at the time of the menopause. This class of cases will almost always respond readily to this treatment.

Another form of high frequency electricity known as the vacuum tube discharge or what is called the violet ray, has been found most valuable in the treatment of acute adenitis, in the abortion of boils and carbuncles, in the management of acute pelvic inflammation, irritable spine, atrophic rhinitis and some forms of neuritis.

It has been impossible in this short paper to give more than a most superficial and incomplete review of the effect and therapeutic application of the various physical methods made use of in medicine.

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The Problem of the Physiotherapy Aide*

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Modern physical treatment methods have taken on a new importance since their value was proved on so wide a scale in World War hospitals (1). At that time medical officers found the number of patients needing such treatments to be so great that it was impossible to give them personal attention. Technicians were found a necessity for this purpose, and so the conception of the physiotherapy aide came into being. Where to find a corps of young women, however, who would be capable of undertaking this work was the next problem. A coast to coast canvass of women's colleges was determined upon and, as a result of this effort, some five thousand undergraduates and their instructors patriotically volunteered their services. About nine hundred of these alert students passed the required tests and were given intensive three months' courses of didactic and clinical training at designated centres. Corrective exercises, massage and, especially, modern electrotherapy were taught them by eminent specialists. The service rendered our war invalids by these high type young women elicited the admiration of everyone with whom they came in contact.

Unfortunately, the uncertainties of the transition period between Army control and Veterans' Bureau management of hospitals and clinics for exservice men forced a majority of these able physiotherapy aides to change to similar duty in a civilian capacity or to return to their other prewar callings. Some, deeply interested, have remained steadfast and are giving physiotherapy applications in the government's various medical services.

Present day needs of the Army are furthermore being supplied by graduates of the yearly training courses for such aides at Walter Reed General Hospital, Washington; of the Navy, through brief courses at Brooklyn Naval Hospital, New York; of the Public Health Service and the Veterans' Bureau, by engaging the services of former Army aides and of graduates of several schools of physiotherapy conducted by medical specialists.

In the various government activities the duties of a "reconstruction aide (physiotherapy)," according to the requirements of a United States Civil Service examination, call for "administering of treatment of physiotherapy in its several branches—massage, electrotherapy, hydrotherapy, mechanotherapy, thermotherapy; active, passive, resistive and assistive exercises and remedial gymnastics; keeping daily record of the work and progress of each and every patient coming under direction and treatment; making the required reports of the activities of the reconstruction work in physiotherapy." It may be added here that the present shortage in the available supply of aides has done away temporarily with a formal examination; a written request for a socalled rating with the application for appointment, attaching written proof of qualifications, will suffice at this time.

Veterans' Bureau regulations classify aides according to the size and needs of a clinic, whether in a hospital or outpatient: Staff aides apply the actual treatments, with head aides in charge of the various separate rooms of a clinic. The chief aide, usually stationed in the office of the clinic, is responsible to the physician in charge for efficient conduct of the subordinate personnel, including the keeping of systematic records, while an assistant chief aide is at times required for close contact between the chief aide in the office and those in the treatment rooms. This organization, the outcome of past experience, leads to care in applying the various modalities and to economy of time and efficiency in general.

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*Read before the New York Electrotherapeutic Society, May 2, 1923.

The outlook for the mentally alert, well instructed aide, physically strong and of good personality, is an encouraging one, and must improve with favoring medical sentiment. Not alone the physician in private practice, reading aright the signs of the day, must add this useful help to his office personnel but many hospital staffs also begin to realize that the lay public insists on relief through these methods as applied by the trained aide. Large industrial corporations in growing number include physiotherapy with their other means for treating injury, relieving pain, and shortening periods of disability. Almost three times as many accidents occur annually in America's workshops as were treated for our army's actual year of fighting in the recent war, so that the need for an evergrowing force of these aides at industrial hospitals and at state compensation board clinics can easily be realized. Such demands have until now absorbed nearly all available trained personnel in this field and it is only a matter of brief time before the call must exhaust the present supply.

Quite naturally such a prospect will lead many young women to grasp the opportunity, and here the question of adaptability is of first importance. What are the qualities essential in an aide for success in such physical treatments?

Unlike the oft quoted poet, the ideal aide is not born but has developed from a variety of experiences, always with the background of a mentally and physically vigorous heredity.

After a personal acquaintance with perhaps three hundred reconstruction aides, it seems that certain factors would account for the efficiency of those successful in this calling:

Public school education gives the necessary contact with the many varied types found in American households; it engenders a sense of pride in ability and softens rough edges caused by being one of a small family or having had too sheltered a childhood with, perhaps, selfish habits. The team or group feeling is developed, one particularly needed by girls, and one of which the Camp Fire and Girl Scout movements make a special point.

A collegiate course is of importance, with scientific branches as majors. Dr. Wilbur (2) rightfully maintains that a two or three years' college education, as a minimum, should include a knowledge of the fundamentals of biology, anatomy, histology, physiology, bacteria and their connection with disease, chemistry, physics and psychology.

The first socalled professional step is attendance at a normal school for physical education. Unless previously obtained, minimum instruction calls for practical knowledge of the following subjects: Physiology, anatomy, kinesiology, chemistry, histology, massage, applied anatomy, medical gymnastics, physiology of exercise, psychology, child study, hygiene, history of physical education, voice training, military tactics, dancing, play ground athletics and track work. These should be taken up seriously and not as a secondary interest to social or home interests. An active part in the life of the school will be found an advantage later on as it helps to make a girl able to adapt herself to circumstances as they arise, and to carry out her responsibilities.

Then comes training in the technic of physical therapeutics: Aside from such instruction imparted by several leading physicians who are recognized specialists in this field, the writers have knowledge of only two centres, under proper control in the United States, where systematized courses are given to those who plan to be physiotherapy aides in civilian life. A teaching course must, however, ultimately become part of staff duty at every high class hospital, being just as essential as its nurse training school.

One or two years' hospital experience, as a volunteer or a pupil or an assistant, is necessary to get an idea of hospital etiquette and to become used to the viewpoint of the physician. The spirit of cooperation with the ability to follow directions in detail is greatly appreciated in any organization. This is particularly true in a clinic giving many treatments of short duration that require special technic.

New England's profession has for a generation led the country in recognition of the worth of physical therapeutics, and again it is first to offer postgraduate instruction for aides. This refers to the course given in July and August at Harvard University. For the purpose of individual instruction thirty applicants, only, can be accepted. Its program includes six weeks' intensive training in the theory and practice of the various branches of electrotherapy and hydrotherapy, massage, therapeutic exercise in lateral curvature, posture training, relaxation and rhythmic exercise in cardiovascular disease and exercise therapy in brain and cord lesion types of paralysis, kinesiology and muscle training in the aftercare of infantile paralysis.

Now as for the patient and the aide: It is useless to expect good technic from one who has not had a scientific background. Hard and fast rules cannot be laid down as almost every patient presents an individual problem, and intelligent treatment is that which is adjusted to his needs. To a considerable degree an aide can affect the mental attitude of her patients, improve their morale and have a distinctly favorable influence by showing her personal interest in their welfare. Understanding the psychology is most important; so, also, must she show toward him the intelligent, scientific interest that is due him. Every aide must be able to note any significant change in her patient's condition, reporting the same to the one next in authority. The presence of foreign bodies or important changes in a bone condition can often be detected, so that preventive measures may be used and operative procedures averted.

Where the size of a clinic requires this executive, a chief aide can do much to make it function properly. A successful chief aide is one who knows how to tactfully place responsibility on each aide and notice which one is capable of rising to this opportunity given her. A spirit of helpfulness rather than criticism should be the rule to ensure efficiency. Each worker should be made to feel a personal pride in the clinic in which she works, keeping it in orderly, organized, running condition by attention to routine details.

As for salaries in the Public Health Service the reconstruction aide (physiotherapy), receives $720 to $960 a year and in addition appointees will be allowed quarters, subsistence and laundry and those whose services are satisfactory may be allowed the increase granted by congress of $20 a month. In the Veterans' Bureau the reconstruction aide (physiotherapy), is paid from $1,680 to $2,500 a year; the reconstruction pupil aide (physiotherapy), $1,000 to $1,400 a year. Where quarters, subsistence and laundry are available, a deduction of $600 a year will be made from the salary to cover same. In civilian practice these figures are usually higher.

This fragmentary paper would be incomplete did it not condemn socalled schools of physiotherapy conducted by nonmedical, commercial individuals engaged in pouring out a stream of graduates with wholly inadequate training and clinical experience. The physician should be just as particular in learning the source and extent of training of an aide as a prospective assistant as he would be in placing the status of a medical newcomer.

In a physician's private practice, in a hospital ward or in small clinic the most efficient results follow application of the various needed physiotherapy modalities to the patient by the same aide from visit to visit. By thus singling out the case the aide's interest is aroused to speed the sufferer's progress toward maximum improvement. When, however, the handling of numbers in a large clinic is faced, a wholly different situation must be met: Here the frequent long delays to aides, due to overlapping of treatment periods of individual patients at certain instruments, cause such a needless waste of time that the entire program of the clinic is often disrupted. The experience of such service in some of our largest war hospitals finally resolved itself into a full day treatment schedule for each aide. Each of the usual day's seven hours is divided into approximately twenty minute periods for a modality per patient. The same apparatus or modality is conducted by a certain aide for the half day, rotation in all modalities being the rule for all aides in the clinic. The patient begins with, say, a hydrotherapy or a radiant light period under one aide; passes on to another aide for twenty minutes, of, say, massage and corrective exercises; then concludes the visit by, say, a twenty minute period of some form of electrotherapy. This ideal arrangement permits of fractional times for actinotherapy and other treatments, and longer periods or additional ones for other needed modalities. It avoids the needless waste of time in a crowded clinic where one aide would follow a patient from apparatus to appartus; it greatly facilitates service for a much larger number of patients; keeps the aide in touch with all modalities; cuts down the ultimate treatment period and the resultant overhead expense.

CONCLUSIONS.

1. The fully trained physiotherapy aide is an essential of present day medical practice.
2. The required training should include collegiate study followed by a course on physical education as a preliminary to one in physiotherapy.
3. The two latter courses should be given only under medical direction.
4. Treatments given by the aide should be prescribed invariably by a physician fully trained in these methods, and her technic frequently inspected by him to assure the best results.

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The Physiotherapy Clinic—A Necessity of the Modern Hospital*

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Physiotherapy, this term having been generally accepted in this country, lately, to designate treatment by physical measures has come to the fore through the splendid record established in the war hospitals. No surgeon or medical man, who has worked in team with a well conducted physiotherapy department, would care to be without one these days. It is the history of all military hospitals that the return of men to the service was thirty per cent. greater than from hospitals where physical methods were not employed. Modern physiotherapy is not a specific for any one type of disease or surgical condition, but it is capable of affording the means for benefiting a wide range of conditions. It takes cases on the basis of a clinically fully established diagnosis and has a full understanding of the pathology underlying the condition. Physicians and surgeons who formerly declared that they had no faith in physical methods, mainly because they have never been taught when and how to apply them, are more willing "to be shown" now. Thousands of patients who had personally experienced the advantages of well conducted physiotherapy departments in war hospitals and numerous physicians having witnessed the results, are pleaders for physiotherapy in many communities.

The main argument in favor of physiotherapy is the economical one. There can be no dispute on the question that by the combined application of surgery and physiotherapy, the period of disability is shortened in almost every case and many patients who would have been cripples permanently and thus burdens upon the community were returned to productive work. There are about five million accidents annually in the United States, one million people disabled permanently. This alone opens up a great field for the correct application of physiotherapy, and there is everywhere evidence that insurance companies and modern hospitals are fully realizing the great possibilities in this direction. But physiotherapy is penetrating in every other department of medicine and its coordination will benefit every specialist, the internist, the neurologist, the gynecologist, the dermatologist, the pediatrist, and many others considerably.

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There is also no question about it, that physiotherapy measures are practised at present in many places more or less extensively. Some institutions pride themselves upon an elaborate hydrotherapy equipment, but have nothing else; others call a few pieces of galvanic and faradic outfit and a high frequency (misnamed violet ray) box an electrical department, others fill up space with Zander apparatus doing passives exercises only. Scientific massage, in coordination with other physical measures, is not heard of in most of these places. It remained for the experience of the war hospitals with many thousands of cases to work on to demonstrate that the best therapeutic results are achieved only by the proper selection and combination of all physical modalities. No surgeon will be willing to operate with half a dozen tools, or no internist will agree to use only half a dozen drugs, after they have seen the advantages of a full therapeutic armamentarium. Modern physiotherapy employs a wide range of physical modalities and while it is possible to a certain extent to interchange the therapeutic action of some of the modalities, as a rule each one has its definite indications and contraindications.

The equipment for a modern physiotherapy clinic should, therefore, include all of the recognized modalities, such as in electrotherapy, static, high frequency, galvanic, faradic, sinusoidal currents and ultraviolet and x rays; in mechanotherapy, massage, active and passive motions and therapeutic exercises; in hydrotherapy, whirlpool baths, showers, Scotch douches; in light and heat therapy, electric light cabinets and a full set of radiant light and heat applicators, as radiant light and heat is used as an introductory to almost every form of physiotherapy. The equipment for a modern physiotherapy department is, therefore, undoubtedly an expensive proposition on first investment, running into thousands of dollars, but it will be a useful investment.

The machinery will last for many years. The patients receiving the benefit of the physiotherapy treatment will always be willing to pay to the extent of their ability. Therefore, the physiotherapy department will be more or less on a selfsustaining basis. There is already a deplorable tendency in some quarters to capitalize the readiness of patients to pay for physiotherapy treatments. It will work a discredit to physiotherapy, if perfunctory rubbings are substituted for real massage, five minute light treatments for real heat and light therapy, and a few minutes play from a cheap high frequency box for real electrotherapy. No more patients should be admitted than there is sufficient personnel and equipment to handle them.

The success of a physiotherapy clinic depends on a full equipment and an adequately trained and supervised personnel, with a responsible physician in charge and as many medical assistants as necessary. The director of a physiotherapy department should have an all around knowledge of medicine, combined with a knowledge of the action and mode of application of the various electrical and physical methods. As physiotherapy penetrates into almost every branch of medicine, therefore, the diversified experience gained by general practice is essential training for a physician in charge of a physiotherapy department.

Since the average surgeon, physician or hospital intern has not had sufficient training in various electric and other physical modalities, the logical way of acquiring the assistance of the physiotherapy department would be to give a general order for physiotherapy and specify the results desired by it instead of trying to give an exact physiotherapy order from the outside. The order for the specified physiotherapy should be left to the physician in charge of the physiotherapy department. Therefore, orders from other departments should read as follows: physiotherapy to increase flexion of wrist, physiotherapy to relieve pain in knee, physiotherapy for eczema of hand, physiotherapy to chest for chronic bronchitis, physiotherapy to develop paralyzed muscles of right thigh and leg, and so on.

Patients should be referred to the physiotherapy department with a full account of the history—physical, x ray and other examinations done. On the other hand the physiotherapy department should not content itself by merely accepting the diagnosis sent, but in any doubtful case, make its own diagnosis.

Physicians of other departments having referred patients to the physiotherapy department should keep track of their patients and should be frequently invited to visit the department and watch and if necessary, criticize its results and should be taught to grasp the fundamental physical principles underlying the application of the various modalities. As electrotherapy and other physiotherapy measures are much more capable of explanation and visualization than many forms of drug therapy, it will not be long before physicians who formerly knew nothing about them will become actively interested. It is especially gratifying to see the eagerness with which recent graduates of medicine try to make up for the failure of their colleges to include practical physiotherapy in their course of teaching.

The actual treatment of the patients in the physiotherapy department is in most every institution usually given by trained workers. Physicians in charge content themselves mainly with the prescription and control of these treatments. Whereas before the war it was difficult to get an all around trained personnel for physiotherapy, the war hospitals have produced a new type of personnel, the physiotherapy aide. These aides were, as a rule, trained in all branches of physiotherapy and were readily absorbed after the war by many private physicians and clinics. It is regrettable, however, that with the passing out of the war hospital training opportunities, there is at the present no civilian medical institution of standing that would train such workers.

There are many masseurs and socalled physical culture workers who have acquired some rudimentary knowledge of electrotherapeutics, but in most cases not sufficient to make them dependable physiotherapy workers. There should be enough opportunities given by hospitals, dispensaries, and private institutions to train properly physiotherapy workers and enable them to work under medical direction; otherwise the public demand for physiotherapy will, and has already created to some extent, a dangerous form of physiotherapy quackery by some of these people trying to give the public what it wants, at their own responsibility. There is no reason why nurses could not be trained for physiotherapy.

A physiotherapy clinic should be open as a rule all day or at least a full morning or afternoon. It is impossible to run a physiotherapy clinic as another dispensary department for one or two hours at a time. On the average electrical machine not more than three patients can be treated an hour and one worker cannot give properly, more than three or four treatments or massages an hour. A whirlpool bath alone takes almost an hour, and so on. The average time required for one patient in a physiotherapy department, including waiting time, would be over one hour on each occasion. The length of time consummed for treatment will be well repaid by the results achieved.

In the Reconstruction Hospital of New York, the physiotherapy clinic is open from 9 a. m. to 5 p. m. every day and has an evening clinic three times a week from 6 to 9 p. m. Outpatients and inpatients receive their treatment at the same hours and there is enough personnel employed to attend to physiotherapy treatments in the wards of this hospital.

We will try to enumerate now at least some of the conditions in the various departments of medicine where the relief brought by physiotherapy measures is most marked and in which, therefore, a team work of physiotherapy clinic should be principally sought for by the other departments of the hospital or dispensary.

In surgery (1): First, fractures. The method of suspension and traction (which in itself is a physical measure), makes it possible to institute physiotherapeutic means from the very beginning of treatment. These may be carried on at the patient's bedside, with definite improvement. Radiant heat, combined with massage and early motion of the adjacent joints, acts as a restorative measure to the secondary disabilities formerly expected with fractures. In delayed unions or nonunions, the use of diathermy as a stimulant to the production of callus is well known.

In old fractures, with disabilities, such as malunion, fibrous union, stiffness of adjacent joints, edemas, hydrotherapy, massage, diathermia and static applications as the individual case will require, all are of untold value both before and after operative measures, and at times obviate the necessity of operative intervention.

For fibrous ankylosis of the joints, whirlpool baths, diathermia, manipulation and stimulation of the adjacent muscle groups, with static and sinusoidal are the safest and quickest means of restoring function.

The value of physical measures in scoliosis, flat and weak feet and other deformities is well known but not widely enough practised. Applications of splints and other mechanical appliances alone are never satisfactory. It remains for systematic use of exercise, massage and sinusoidal currents in wellconducted physiotherapy clinics to strengthen and rebuild the bony, ligaments and muscular parts.

Freeing of adherent scars to underlying structures may frequently be accomplished with deep local massage, ionization and whirlpool baths.

In nerve injuries the diagnostic and therapeutic value of electricity cannot be measured. Both before and after operative procedure the proper selection of the various modalities of electricity and massage are of prime importance. The maintenance of nutrition in the involved part, the selection of proper splintage and maintenance of posture of the part, taxes to the utmost the skill of both the surgeon and physiotherapeutist in their effort to secure the desired result. In the diagnosis of peripheral nerve injury, clinical examination informs us of the paralysis of the muscles controlling the movement of the various joints, and of the cutaneous changes in that portion of the skin supplied by the injured nerve, but it is only through accurate nerve testing that we may determine and demonstrate actual muscle paralysis or measure the degree of weakness present in a muscle. During treatment, actual nerve testing alone shows us the progress being made or the failure of nerve conduction to occur.

The value of immediate electrotherapy in sprains and strains from the onset of the injury, is in hastening the processes which under rest and immobilization occur only very slowly. Radiant heat and static wave current, at first gentle and later vigorous massage, so modifies the period of disability that immobilization can usually be dispensed with.

In no condition is the value of physiotherapy more clearly demonstrated than in the treatment of the frequent and difficult condition of osteomyelitis. Following the removal of sequestra, the usual sluggish reparative process is remarkably stimulated by whirlpool baths or radiant heat or ultra violet radiation, and the secondary contractures and stiffness of adjacent parts prevented by heat and electricity.

One might go on almost indefinitely illustrating various other types of cases which might benefit through the coordination of the available physiotherapeutic and surgical measures.

When it comes to border line cases between medicine and surgery, myalgia, myositis, neuralgia, neuritis, lumbago, and other conditions, the relief by properly applied physiotherapy is often instantaneous. Radiant light and heat, massage, static current or diathermia are the modalities to be used. Arthritis in its acute and chronic forms of traumatic and toxic origin is being treated with excellent local results by radiant heat, diathermia, and static wave and sparks. Electric light baths and autocondensation will aid as constitutional measures for keeping up the patient's elimination. Mechanotherapy and massage will help to mobilize the stiffened joints. Of purely medical conditions, chronic bronchitis and certain forms of asthma will yield satisfactorily to the employment of radiant light and heat to and diathermia through the chest. Pleuritic pain, intercostal neuralgia, herpes zoster can be relieved, rapidly, by radiant light and heat, static current, ultraviolet light, or static brush discharge.

Atonic forms of constipation can be gradually and surely improved by the application of sinusoidal currents. Lax, flabby abdominal walls, local and general accumulations of fat can be safely restored by the combination of radiant light and heat, passive ergotherapy in the Bergonié chair and massage. The same apparatus will greatly help to restore circulation in cardiovascular cases, while cases of myocarditis will be favorably influenced by diathermia applied through the cardiac area. Vibration of the cardiosplanchnic centres, at their exit spaces through the spinal foramina, has given remarkable results in some cases.

The neurologist will find the help of electrotherapy, massage and exercise invaluable for the restoration of function in infantile paralysis and peripheral nerve lesions. Contrary to popular belief functional cases of nerve diseases do not constitute the main playground of electrotherapy. Electrotherapy should be used with brains, and not for brains. Cases of neurasthenia, hysteria, and sleeplessness are, however, favorably influenced by these measures, if combined with proper constitutional treatment. Neuritis will yield to physiotherapy, if at the same time the exciting cause can be removed. Eminent gynecologists have published recently their favorable experiences with electrotherapy in infantile uterus sterility, amenorrhea, endometritis. The galvanic current, ionization, and in cases of infantile uterus, subsequent sinusoidal applications will be the modalities used. Spasmodic dysmenorrhea will yield to static wave applications through a rectal electrode.

In the male, cystitis, epididymitis, prostatitis, can be very successfully treated with diathermia and static wave current. Anal fistuli and hemorrhoids can be dealt with painlessly by ionization and surgical diathermia. Hydrotherapy is a most valuable adjunct in dealing with the various sexual neuroses. Finally, in dermatology, acne will be favorably influenced by ultraviolet radiations or high frequency sparks; alopecia is amenable to ultraviolet rays; ulcers, small growths, phlebitis, are readily treated by high frequency sparks or desiccation and static brush discharge. The wide range of x ray therapy in skin conditions is too well established to necessitate more than mentioning.

CONCLUSIONS.

There is an undoubted necessity for a physiotherapy clinic in every modern hospital and dispensary. Physiotherapy is a specific only in a limited number of cases, but of great benefit in a vast range of surgical and medical conditions. Recent investigations of all New York hospitals and dispensaries (2) have shown that most of them had some physiotherapy equipment but less than half a dozen had one that would constitute a full modern physiotherapy department. Similar conditions prevail undoubtedly in other large American cities. Boston is the only city that has a fully equipped and well run physiotherapy department in a municipal hospital. It is to be desired that all hospitals and dispensaries claiming to offer their patients all modern means of restoring health and working ability should organize as soon as possible a physiotherapy department in the modern sense, which means full equipment, fully trained personnel, and physicians fully understanding how to prescribe and how to use electrotherapy and other physical measures, in cooperation with the hospital staff.

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The Urgent Need for a Greater Use of Physical Therapy by Internists*

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In what I have to say I shall be obliged to criticize an attitude and a practice which is almost universal among internists. The attitude which I censure is one of indifference, and the practice that of neglect maintained toward an invaluable remedy—physical therapy. By this neglect we internists are doing great harm both to ourselves and to our patients. We are allowing many of them to become permanent invalids, when by appropriate physical therapy they might be restored to health and so saved from the physical, moral and economic evils of incurable disease.

Lack of special endeavor to prevent patients from remaining chronic sufferers and perpetual burdens to themselves and others, is much more common among medical practitioners than surgeons. As you know, this is becoming strikingly evident in hospitals, where, if we are open-eyed and open-minded, we must concede that surgical cases, acute and chronic, are the best provided for. Hospitals and sanitaria are always willing to admit an operative case; every facility, every comfort, every possible requirement is at hand for its care and consideration. Every practitioner who is more or less familiar with the use of surgical instruments is willing to serve and anxious to please a patient who is presented as an operative case; for these are always interesting, usually not protracted and thus not taxing to the patience of the surgeon; the results are immediate, the changes often profound, the patient and friends are grateful; hence, the remuneration, material and professional, is generally satisfactory.

But what about the medical case? Those of an acute character, at least, are given some attention, though less than surgical cases. They are admitted to hospitals quite readily, and in so far as they require only medication and nursing, proper care is accorded them. When, however, the case is a chronic one, the situation is then altogether different. It is here that numerous sins are committed, that unpardonable errors are made. Of course it is true that chronic cases are often tedious, usually uninspiring and discouraging, the best efforts of the practitioner being frequently unappreciated. Nevertheless our duty toward the chronic sufferer is no less stern and unrelenting than to the acutely ill patient whose life we are striving to save by all the means at our command. We are in duty bound to use no less effort in the treatment and rehabilitation of chronic than of acute sufferers. The use of pills, lotions, kind words or patting on the back does not always help in chronic diseases, for these are characterized by actual morphological and chemical tissue changes which may require radical, rational and appropriate intensive therapy to effect a reversion to the normal. And how do some practitioners meet the situation? Do busy physicians always give such patients the necessary care and deliberative attention? In many instances, no; seldom is there even a thorough analysis given the patient, who receives merely a prescription, accompanied by a few useless recommendations which naturally afford no relief. Later another, a third and a fourth ineffectual remedy is prescribed, until the patient tires and seeks help from other sources. Such sufferers constitute a vast army and their number will not diminish until we have recognized the cause of their defection and shall have included in the regular medical practice a more extensive use of physiotherapy.

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HISTORICAL.

In so far as the remedy for this lies in a greater use of physiotherapy, we are not dealing with a new method of alleviating suffering, but with one that is old and well tried; for physiotherapy is the oldest of medical disciplines. Centuries before man made an attempt to free himself from discomfort and pain by the use of drugs, physical means were in use. Lower animals are led by intuition to seek relief from pain and sickness by resorting to heat, cold, friction and similar physical methods. Such tropismatic and semitropismatic tendencies were evidently inherited by our early ancestors. The study of primitive man and of the distant past shows that at the lowest known culture levels men possessed the knowledge of heat and cold, of rubbing, of baths, of mineral waters, of emetics and purgatives, and that they utilized their knowledge in the bringing up of their young, the development of their bodies in strength and skill and in the treatment of disease. As long as primitive man followed his natural instinctive trends he could not go wrong, but in this, as in other provinces of man's life, his newly acquired, imperfect thinking powers have led him astray from his true, natural course into new, injurious and irrational ways. Professional wise men, shamans, sorcerers, priests and other manipulators and promoters of medical dogmas diverted medical practices from the simple, inherent reactions of animal behavior and replaced them with strange, distorted and gruesome rites. Even in the earliest times, medicinal waters were placed under the patronage of divinities and were subject to occult influences. Prayers, incantations, charms, ridiculous and repulsive substances were held to reinforce the effect of heat and cold, of baths, of friction, of waters, etc. For instance, the pool called Bethesda (1) at the sheep market in Jerusalem, was healing only to the one who entered it after the waters had been troubled by an angel. Religion was injected into the science and art of healing at every low cultural epoch.

At a later period, in Greece and Rome, bathing, gymnastics, diet and massage were prescribed, not only for the development of sound, healthy and skillful citizens, but also as therapeutic measures for strengthening the body and promoting health. The temples of Æsculapius distributed throughout Greece were genuine sanatoria. They were situated in sacred groves, near mineral, thermal or sea water, in sheltered regions. They were in the hands of hereditary priests, but these, fortunately, seem to have realized the connection between natural therapy, moral influences and physical development. Hippocrates thoroughly understood the value of air, food, rest, exercise, sleep, the rôle of the excretory processes, of psychic conditions, weather and seasons, and laid down the simple, rational rule—which is even today often disregarded—that "If excessive fatigue has induced a disturbance, rest is required; if, on the contrary, it is the result of inactivity, it is exercise that must be employed." Credit is also due him for being the first to declare that cold water warms the body and hot water cools it. He recommended hydrotherapy in a great many conditions, and so much was he impressed by its importance that he held it to be a physician's first duty when first coming to a town, to become acquainted with the peculiarities of the water in any town to which he went. His methods of administering cold baths, of rubbing, and showers were carried out by his disciples and his many dietetic regulations survived for a long time.

Roman medicine, which was in a state of gross superstitious barbarism before the conquest of Greece, quickly felt the influence of Greek civilization. Gymnastics, massage, diet and hydrotherapy replaced the crude practices of the pre-Grecian period. Public baths were soon built in all Roman settlements; wonderful establishments were then provided for gymnastics, baths and social entertainments; mineral waters and hot springs became esteemed. There are still in almost every famous health resort of Western Europe the remains of Roman baths, some of them, such as the ruins at Bath, England, showing evidence of magnificence.

Arabian medicine, which weakly bridged the gulf between the Greco-Roman and Renaissance periods, was timid and especially reliant upon drugs. During the Dark Ages systematic care of the health was not only made difficult by the prevailing degradation of all the arts of life, but the most influential intellectual forces of the time were opposed to all solicitude concerning the body. But with the beginning of the fifteenth century, physical therapy regained some of its favor, and even charlatan surgeons began to use water in the treatment of wounds. In the sixteenth century Ambrose Paré observed, at the siege of Metz, that an ignorant empiric who treated wounds with water, lint and incantations, had good results. Paré began to treat wounds and fractures with cold water, saying: "I declare it is not the words nor the cross which do it, but the water which cleanses the wound and protects the injured limb from inflammation and the contact of other fluids by its coldness," and he gave up the use of hot oil in dressing wounds.

During the sixteenth, seventeenth and eighteenth centuries, physical therapy had several periods of popularization and decadence. Thus, at one time the public baths were altogether closed for a long time because the spread of syphilis among the people of Europe was attributed to their use. On the other hand, in Germany, since the seventeenth century, hydrotherapy has often been considered a panacea for the cure of chronic and acute diseases. There it has received its greatest impetus, and there the cure of chronic diseases seems to have advanced further than in any other part of Europe.

If we compare the progress of applied physiotherapy during the past century and a half with that of other branches of therapy, we note that in spite of the considerable advances in the latter, the advance of healing by physical methods has remained relatively low. And why? Because intense individualism was characteristic of that period. Professional education then became largely an affair of apprenticeship; young men read law or medicine while they were acting as clerks or janitors in the offices of their masters. The functions of the State were reduced practically to police measures; every State undertaking designed to improve the conditions of suffering humanity, met with tremendous opposition; free schools, free textbooks, public baths, state hospitals, were regarded as instruments of decay, calculated to undermine personal initiative and independence. Individual responsibility was the religion of the time and hardly any rational limits were set to its scope. Thus progress until the present decade was slight.

PHYSIOTHERAPY AND THE WAR.

Opportunity was provided by the late war for an immense and illuminating demonstration of what physiotherapy may accomplish. The materials were: 1, vast numbers of wounded coming from every front; 2, powerful motives for returning the disabled to their armies with a minimum of delay, and, 3, the great unstinted resources of governments. The results achieved in hospitals and reconstruction camps during and since the war may appear to some like a marvelous new development. But in reality it was not a new development at all; it was only a great scale repetition of what had already been accomplished in a smaller way. It should not be overlooked that ardent and expert physiotherapeutists already existed and that they were eager to do for large numbers what they had already been doing for the few. Physiotherapy aides were, indeed, trained during the war, but the immense service rendered to the wounded and disabled soldiers by the application of physical remedies was due to those faithful enthusiasts who had already, before the war, brought physiotherapy to a high standard of perfection.

In the German army this fact was brought out sharply. It was there that the first and very intensive application of physiotherapy was made. This was natural, inasmuch as in Germany physiotherapy had already occupied a position of greater importance than in other countries. Since the inauguration of the Bismarck socialization measures, many state subsidized sanatoria, socalled *Kurorte*, have employed physical therapy almost exclusively. These large, wellequipped institutions with their trained staffs have taught the whole German medical profession the resources of physiotherapy. Hence its general and instant application in the German army. In the armies of other nations it took some time to familiarize their medical corps with the resources and advantages available in physiotherapy before these could be made fully available in the treatment of the disabled soldiers.

STATISTICS.

A small fraction of the remarkable results obtained by means of physiotherapy, both in military life during and after the war and in civil life in industrial institutions, is illustrated by the following statistics:

Granger (2) writes: "In the army ninety per cent. of all cases treated by physiotherapeutic means were able to resume their former or allied vocations. Two points in this connection should be noted; first, there was a marked shortening of the time of disability; second, many who otherwise would have been permanently crippled and would in consequence have been a burden to the community, were returned to productive and remunerative occupations. The economic gain resulting from these two factors means a marked saving to the industries, to the insurance companies and to the individuals who have been incapacitated." Mauclaire (3) reports that in France physiotherapy was used for functional reeducation at fifty-three centres upon 22,000 wounded soldiers, of which 19,000 or eighty-six per cent. were returned to their respective occupations. Sammons (4) states that in his injury cases treated by physiotherapy the results in eighty per cent. were all that could be wished for; of the other twenty per cent. in which nerve anastomosis were followed by a full course of electricity, massage and hydrotherapy, only a small fraction remained unimproved. Burke (5) in his report on the electrical department of the Horton War Hospital, states that of the 958 patients treated there, about thirteen per cent. were cured, twenty-four per cent. much improved, sixty-eight per cent. fairly improved and only five per cent. unimproved. The number of complete recoveries, he says, was undoubtedly greater than the percentage specified, as many of his socalled improved cases were transferred to other institutions before their complete cure could be effected. Raynal (6) studied 504 histories of soldiers with wounds of all types and degrees of severity, affecting every part of the body, who had been treated by physiotherapy. He found that thirty per cent. were cured, sixty-two per cent. improved and about eight per cent. unimproved. Fox (7) emphasizes the importance of prompt treatment before physical and psychical habit has reduced the chances of cure; he gives the following statistics: Out of 3,348 soldiers suffering from disabilities of all kinds, who received a full course of treatment and were discharged from the hospital within six months, 2,676 or about eighty per cent. were cured or so greatly helped as to be returned to their depots; 457 or fourteen per cent. were recommended for auxiliary service, while only 215 or six per cent. had to be discharged from the army because of disability.

In the Anglo-Belgian hospitals at Rouen (8) 2,020 soldiers received physical therapy; of these 1,170 or nearly fifty-eight per cent. were sent to rejoin their depots as completely cured; 670 or thirty-three per cent. were recommended to the military institution for industrial training; only 180 or nine per cent. had to be returned to their homes as invalids. Figures have been published in France which show that an average reduction of the mass of physical disability—say twenty per cent.—saves the State in pensions and gratuities nearly fifty million francs yearly. The saving that is accomplished by the return of the men to industrial life is, of course, immensely greater than this sum.

Finally, Major Charles P. Hutchins (9), after describing the reconstruction work done at Fort Sheridan, says of physiotherapeutic measures: "By right of accomplishment in a hundred thousand cases of war illness and injury alone, they have won their place in the regular curricula of medical pursuits."

Industry, alive to the importance of restoring health whenever it constitutes a reduction of expense, is already becoming the next large beneficiary of physical therapeutics. Many employers, having learned their lesson from the governments, have established physiotherapy departments in connection with their industrial institutions or hospitals and afford physical treatment to their injured or maimed, thus benefiting themselves and their employees. As an example of how physiotherapy serves industrial medicine, Wainwright (10) publishes a table showing the length of time of disablement in uncomplicated simple fractures in two groups of mine and railroad employees, treated before and after the installation of a physiotherapy department. There were about 125 men in each group.

	Before	After	Saving in days	Percent imp'ment
Clavicle	67 days	59 days	8	12
Humerus	125 "	90 "	35	28
Radius, ulna or both.	76 "	64 "	12	16
Femur	239 "	180 "	59	25
Tibia, fibula, or both.	121 "	92 "	29	24

The saving effected in this small group is given as about four thousand dollars a year, which, of course, means only a direct saving in compensation; the ultimate benefit to society can not, of course, be estimated in dollars and cents.

The conclusion one must draw from these few statistical data—time and space not permitting greater expansion—is that an unbelievably large percentage of cripples of all kinds, in military and civil life, with injuries and disabilities of every degree of severity, have been through the use of physiotherapy, either completely cured or nearly so, and that these cripples were returned to their homes, families and countries happy and useful citizens, whereas without the benefit of physical therapy they would have remained cripples, a burden to themselves and to society. What other means of therapy, not even excepting surgery, can boast of so marvelous a showing!

OBSTACLES TO GREATER EXPANSION.

But has the medical profession or the general public benefited by this demonstration of physiotherapy? Apparently not yet. The remarkable reconstruction work which effected such brilliant results has not been continued in civil life because, as Cotton (10) says, of lack of teamwork between surgeon, neurologist, internist and physiotherapeutist. There are also many other factors which appear to be against a general expansion of physiotherapy. In all institutions caring for chronic, disabled invalids, there is a lack of appliances, and before the civil population as a whole can be given the benefits of physiotherapy, greater facilities must be created, not alone in equipment but also in personnel. Physicians here must overcome the apathy which has left us so far behind the foremost European countries; they must overcome the unwarranted distrust of the pioneers who have the courage to practise physiotherapy. The rejection of curative agents solely because these have been tools of charlatans is a remnant of timid orthodoxy which has too long fenced us off from one of the most fertile fields of medicine. This timidity has been essentially overcome by some surgeons; the fair-minded surgeons, as Snow (11) points out, are now becoming less antagonistic to physical therapy because of their knowledge of its possibilities, first acquired by them during their service in the war. On the other hand, grasping surgeons—and they constitute no negligible number—are still hostile toward it. There is, however, no doubt that the physical therapeutist will soon be part of the staff of every busy surgeon or institution. Billings is convinced that every hospital needs a physical therapeutic department just as much as an operating room. Certainly no institution which undertakes to treat chronic diseases or industrial injuries can produce first class results within a reasonable time without provision for such work, and it may be presumed that within a short time no such hospital will be able to face its community and confess that it has not made such provision (Cotton, 12).

Before a full and extensive use of physiotherapy can be made, there must be a spread of special knowledge of the subject. Fruitful and safe work in physiotherapy, as Sampson states, renders necessary the correct selection of appliances and an accurate application of their modalities. Inaccuracy or improper modality is fatal to success. Investigations have been conducted in physiotherapy to determine the doses and methods applicable in certain definite pathological conditions; ignorance or neglect of these scientific physiotherapeutic data must result in failure as surely as the improper use of drugs. The therapeutist, before he can achieve good results, must be thoroughly familiar with the potentialities and modalities of the numerous physiotherapy appliances. Physiotherapy is a skilled art which calls for both training and natural aptitude.

The difficulties which exist on the score of expense are also at present momentous. And even if the cost of equipment had not to be considered, the sum required for the maintenance of a physiotherapy department might be regarded by some as prohibitive. But this should not even for a moment come into consideration when the welfare of the patient and the community is at stake. Besides, on the ground of economic expediency, a department of physiotherapy is a profitable investment, yielding large returns in the saving of labor power and the reduced force of caring for the incapacitated, as well as the moral and esthetic satisfaction that accrues from all successful efforts to minimize sickness and disease. When its great and manysided usefulness is once recognized, its cost would no longer be considered, and large scale provision for physiotherapy would come to seem as indispensable as provision for operating rooms and extensive diagnostic equipment seems to us at present.

Wilful neglect of physiotherapy by internists, or of rehabilitation and vocational training, is incomprehensible in view of what these have lately accomplished; for the internist to go on ignoring agencies with such a record of beneficence is inexcusable folly toward himself and cruelty toward his patients. It is not asserted that physiotherapy is either a panacea or an exclusive remedial procedure. In chronic diseases, especially, every possible curative means may be required, for in these cases excretion, metabolism, circulation and endocrine functions may all need restoration, balancing or stimulation. Any and all remedies may be applicable, and the physician should be at liberty to use them all; they are his rightful tools, and he should not permit them to be usurped by any cult or schism. Nevertheless, physiotherapy holds a unique place among the other remedies because it permits of many applications and comprises many means for helping to restore abnormal conditions to normal. Its use, in the main, develops forces which stimulate life processes—forces which in normal health are competent to increase strength and vigor and in subnormal or abnormal health act by the same dynamic mechanism on the cells and tissues, exalting, depressing or transferring their energies in ways which increase benign and diminish vicious activities. All in all, its value is so great that any medical man or institutional group who accepts the responsibility of treating chronic disease without making provision for physiotherapy, is committing an injustice to the patient, the community and the medical profession. Failure to provide such therapy fosters pseudoscientific practitioners, strange cults and weird healers.

My personal experience with physiotherapy dates back to about ten years ago, when, during a prolonged stay abroad to study diagnosis and institutions, I had the opportunity to familiarize myself with its great possibilities. The extensive equipments of the sanatoria which I visited in Austria and Germany, their trained personnel, the strict regimen and regulated tactics, and their results, more than sufficed to impress me favorably. Physiotherapy is the basis of the successful treatment of chronic diseases abroad and of the conspicuously small number of operations. Sun baths, mineral spas, Zander institutions, inhalatoriums, and other institutions, are features of all healing places throughout Germany and Austria. There, marvelous results are often achieved in cases which in this country would either be subjected to some exploratory operation or be classified as incurable and condemned either to endless suffering or allowed to fall into the hands of quacks.

The application of physiotherapy to medical cases is unlimited. Among those suitable for treatment may be mentioned obesity, hypertension, nephritis, neuralgia, neuritis, paralysis, gastrocoloptosis, gallbladder, catarrh, chronic appendicitis, constipation, general atonicity, neurasthenia, hysteria, tuberculosis, and numerous other chronic diseases. Many of these conditions are benefited quite as certainly as those surgical cases which have already contributed so much honor to physical therapy; and the medical practitioner, if he were wise, will make use of these physical agencies quite as extensively as many surgeons are now doing.

PHYSIOTHERAPY VERSUS QUACKERY.

Quacks are availing themselves of the riches that we ignore, and, fortified with our honorable tools, they are building socalled schools of medicine by which they prey upon a large fraction of society. Since society is an organism of which the suffering patient is a part, his failure to find relief from sickness has consequences in which we among many others are included. When the patient is of the sort that, through good or ill, never forsakes a favorite physician, one fruitless medication after another may be tried for an illness that is meanwhile speeding toward incurability, although it may not at the beginning have been irremediable. Here the evil consequences do not conspicuously affect the physician; he does not suffer in honor or profit. It is much the same case in regard to those less trusting patients who go from one physician to another; gain and loss are likely to balance, and no special discredit attaches to the loss of such migratory patients.

Far more numerous than these two classes are the patients who, discouraged with all regular physicians, seek relief through socalled irregulars. These irregulars, whatever their label, nearly always employ one or more socalled natural remedies. Their science is a smattering of physiotherapy, ignorantly conceived and ineffectually and incorrectly applied, and yet, not infrequently helpful. If a patient receives even slight benefit from one of these, he is likely to announce it with unstinted praise, and the more he had previously sought relief through legitimate medicine, the more material has he for invidious comparisons.

If, on the contrary, a patient is not benefited, or even if he is harmed, he usually conceals his adventure into quack medicine. In the first case the quack gains reputation; in the second, he does not lose it, and he exploits every success to the utmost, advertising himself by contrasting his socalled cures with the actual failures of the regular practitioner. All too often he is assisted in his selfexploitation by honest and reputable patients who have been thrust into his care by our neglect of priceless remedies, which, even in the hands of a quack, prove superior to our ineffectual because inappropriate therapy.

This is the true explanation of the great present prosperity of the pseudo-legitimate healing cults—of osteopathy, chiropractic, naturopathy, Kneipp cures, etc. On the one hand, chronic sufferers are many, and there also exists a widespread respect for those means of healing which people conceive as natural, i. e., heat, cold, bathing, rubbing, exercising, and others. On the other hand there are charlatans—also many—ignorant and unscrupulous but astute enough to give the people what they want, and with the advantage that the things desired are really good and useful when properly applied. The treatments, in part at least, are so simple and easy of application that, even when applied indiscriminately and by tyros, they produce many conspicuous cures and improvements. The inevitable result is—busy and prosperous irregular practitioners, less busy and less prosperous regular ones. To a large percentage of our profession the economic loss created by this situation means the difference between poverty and a decent competence; but even more serious are the moral and humanitarian issues involved. By unintelligent, obstinate adherence to the exclusive use of drugs and, until recently, of unassisted surgical procedures, the medical profession has not only sacrificed much honor and confidence, but has refused a legitimate means of help to that great stream of sufferers who have turned for relief to illegitimate healers, by whom, though now and then one patient is cured or his condition improved, many are irreparably damaged and almost all risk serious harm.

CONCLUSIONS.

The number of cults and charlatan practitioners, instead of diminishing, as it ought to do with the spread of education, is actually increasing. Even greater is the proportionate increase in the number of patients who resort to quacks, with the result that in this country the latter are becoming every day more numerous, more prosperous and more confident.

In European countries, where the practice of physical therapy is most developed, irregular medical practices are at a minimum. By making the fullest possible use of such remedies as baths, electricity, gymnastics, massage and sunlight, physicians in those countries deprive quacks both of the means to victimize and of the victims. With us, the internists have left to quacks almost a monopoly of physical remedies and have been supplying them with streams of victims.

For this evil the internist is not alone or is he altogether to be blamed—like most evils, its causes are complex. But on two counts at least he is guilty. First, he has kept in the easier way of drug therapy instead of working to create facilities for the use of physical therapy; and, second, he has timidly shunned the use of physical remedies simply because these were used by quacks and for that reason discredited by association.

We must recognize our responsibility for the situation which exists before we can hope to cut off from the consultation rooms of the irregulars and from the churches with healing cults, the streams of chronic sufferers. And before we can hope to command full public confidence and respect, there must be a general recognition that, though neither infallible nor omnipotent, we are doing the best we can. For it is through our apathy and timidity in surrendering to charlatans these rich therapeutic fields, that they have gained an appearance of solidity, and even superiority, which has deceived many tolerably intelligent and instructed people. We have allowed this situation to develop; we can best abolish it by making a thorough, intelligent and conscientious use of physical remedies—remedies which in spite of their neglect by the medical profession, have always retained a widespread, almost universal, respect among the people. By satisfying this legitimate, seemingly inherent desire for ways of treatment which appear natural, we can safeguard the public against malpractice and incidentally regain its confidence far more quickly and thoroughly than we can by giving time to the securing of legal restrictions of irregular practitioners and the punishment of offenders.

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Electrotherapeutics in Urology

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In the library of a New England College is a *Chemistry* of 1850 written by a man sufficiently able to have been a clergyman, writer, professor and chemist. In those days the alert mind could acquire the final knowledge of several vocations—knowledge which today belongs to the junior or senior of academic or professional school.

The opening paragraph of that chemistry states that there was then before the scientific world a theory concerning the organization of matter called the atomic theory and that for the purposes of the book the said theory would be denied and disregarded!

There is now before the scientific world a new theory concerning the organization of matter known as the electron theory. It assumes that the atoms are composed of inconceivably small electric elements —electrons. There are those who deny this theory and they will be as ridiculous fifty years hence as is the writer of the said chemistry of 1850 in the light of modern facts about the atomic theory.

Lincoln said that the only people he did not like were those he did not know. Most physicians seem guilty of the same blunder in not liking any new method of treatment which they do not know. Conservatism, reserve and caution are sound when based on a willingness to study, try and then judge. But radical denial, blind prejudice and arrogant complacency with methods already in vogue are unsound because they have again and again been the bases of cults which have in the end compromised the medical profession. Osteopathy and chiropractic would never have been dignified as separate schools if massage and its allies had been correctly valued, taught and practised.

Christian Science and its allies would never have developed if the influence of the mind on the body had been more directly observed, studied and employed.

Like Lincoln's new friends most of us like new methods after we have learned them. A familiar example is that the medical departments of the United States Services during the war actually ignored and refused to adopt physical methods of all kinds—until they knew them through their results among the European forces. The Government has learned the worth of a new friend—physiotherapy—and has installed proper equipment in many of its large hospitals. The Government was in the same position in which Morse would have found himself if he had denied the possibility of a telephone after having demonstrated his telegraph. At that time no one even conceived of a telephone. Bell not only invented the telephone but lived to see the wireless telegraph, which he might also have ridiculed if even its remote possibility had ever been suggested to him when he gave his telephone to the world. In parallel Marconi not only developed the wireless telegraph but has seen the radio come into the field of communication. Yet no one can show in any of his early scientific writings any definite statement to indicate that he realized the possibility of the modern radio.

Electrotherapy which is only one department of physiotherapy can no longer be repudiated. Those who deny that it has value will soon be like the professor of 1850 in his disregard of the atomic theory. Those who regard it as a quick cure and a cureall will be like the dupes of the promotor whose financial bubble bankrupts them. Diseases are processes hence there can be no sudden and absolute reversal of the processes by any means whatever.

Most of our methods heed basically the circulatory and nervous signs of disease. It is the stimulation or modification of circulation in acute and chronic inflammation by ingestion or topical application that aids very many mucous membrane lesions. Of great importance is correction of nervous disturbances such as pain and its allies, which alleviates much suffering, such as trophic failure which permits restoration to begin.

Bier's hyperemic treatment of joints was aimed to oversupply the lesion with blood and hence augment nutrition and healing. But its basis is a venous stasis and not arterial hyperemia—hence its limitations and early rejection. Personally I never used this method much because its venous stasis is not a physiological nutritional condition. Electricity excites contrariwise an active arterial hyperemia and thus does follow physiological conditions, as will be indicated later.

It seems probable that the electron conception of the organization of matter will be proved much as the atomic theory has been established. Rather than reject the theory it should be tentatively accepted. If it is true about inorganic matter then it is true about organic matter and if true about organic matter then it is true about the human body. Already a leading English physicist (1), in the Kelvin Lecture, states that dependent on x ray penetration and on further research of x ray frequency, the possibility is indicated of restoration by the x ray of electrical equilibrium or health in a cell structure. Whatever may finally be the actual result of Stokes's method of endeavoring to modify and aid ear conditions by fractional doses of x ray, its scientific foundation is in line with what physicists are thinking out in other fields and beginning to teach. It is equally probable that the small doses of rays administered are wrong in amount—too small or too large—and that the quality of the rays themselves remains to be changed by improved methods of developing them. For example, many electrotherapeutists prefer the x rays developed by the multiple plate high speed static machine to those developed by the transformer, for the reason that its very high voltage and very low amperage give great penetration (which is the great desideratum) and cause little burning of the skin (which is the chief danger) in x ray therapeusis. No man may say whether or not a still better source of the x rays will appear sooner or later.

Stokes in a paper read before the New York Electrotherapeutic Society on February 7, 1923, enunciates a suggestion or theory which he describes thus:

"In my research of recent years with the x ray I have assumed that electrical equilibrium, or preferably electronic equilibrium, in the human cell structure is a natural and normal condition indicating a state of health in that structure; and that any upsetting of this equilibrium except through normal physiological excitations and transmissions, means an unnatural or abnormal condition indicating disorder or disease, as the case may be. In the use of the term 'electrical equilibrium' I assume, in line with the electron theory, that all forms of matter are exhibitions of electrical phenomena.

Without going deeply into the generation of x rays, I would like to call attention to the recent important discovery of a reciprocal action when x rays strike any substance. The blast of electrons in the tube on striking the target gives over its energy to the energy of x rays, and the x rays in turn, on impact with any substance, turn over their energy into the energy of moving electrons." The process might be called also electronotropy—change in the electrons—meaning the result of so modifying the pathological state of the electrons that restoration may begin in the body cells and of so influencing the bacteria that they alter or lose their virulence. While all this is theory it can not be ridiculed and it is not in discord with the ideas in the scientific world outside of medicine. In both medical and nonmedical spheres of knowledge proof is to be developed. Since the electrons of living matter are inconceivably minute it is almost certain that very slight electric influences affect them. In other words it is not necessary to frighten or hurt the patient to do good work.

A suggestion of the truth of electronotropy is already established in that the mild currents which the patient hardly feels at all or always finds comfortable are those which do good—in direct opposition to the violent currents in vogue in medicine up to perhaps ten years ago. Lack of space prevents a further discussion of the parallel between the concept of such matters in the sciences of physics, chemistry and medicine. Electricity in medicine is not a cureall. It it fallible in almost any case. Most of its difficulties arise from defects of apparatus, selection of wrong modality, improper intensity of current, too long or too short intervals of treatment, and inexperience in the operator.

Treatments in most conditions of less than twenty minutes are not long enough and usually thirty minutes are a better limit. Hence at least three treatment rooms are required for justice to each patient and for rate of service consonant with the usual one in good work in any other special line, namely six to nine patients to the hour. Such a layout of offices is not difficult but it may be beyond the means of many. This overhead expense is a disadvantage.

The advantages are briefly that the physician alone gives the treatment and in this way controls the patient, who can not repeat, distribute or otherwise abuse the treatment as he does with prescriptions too often. With skill electricity becomes a very exact local means of hyperemia, hemostasis, contraction, and anesthesia.

The following very brief technical description of the currents and outline of their application in urology may be helpful.

They are adapted from a recent contribution (2). Any reader interested in this general subject and wishing to know the history of its progress and to understand the reasons for unsatisfactory results in the past may be repaid by reading this much longer contribution.

FARADISM.

Modern high tension coils give currents according to demand. The outer or secondary coil is the source. Fine windings of wire give anesthetic effect but coarse wire is preferred for physical effect. The markings 1000, 2500, and 5000 mean the number of feet used, according to the switch. The preference is for 1000 feet because of greater physical action. A weighted vibrator, timed to thirty oscillations a second to agree with the muscle fibrillation, is convenient. Interruptions may be made with switch or metronome, at a rate not to exceed the pulse thus permitting inflow and outflow of blood, stimulating metabolism and avoiding the exhaustion or spasm. An insulated electrode applied to the prostate and a large dampened pad to the pubic region are the best. Intraurethral electrodes are not advisable. The strength of current mildly increasing has less respect for sensation than for muscular contraction. The duration is from fifteen to thirty minutes, the frequency alternate days, and the results muscular tonicity, profound circulatory effect and relief of circulatory, glandular and tissue stasis and of muscular atony. The electrotherapeutic alternate is diathermy followed by static wave or the galvanic constant or interrupted sinusoidal current.

In modern urology the use of faradism is to stimulate the atonic bladder and sphincter, especially in postoperative states. Mild currents continued for twenty to thirty minutes are the choice.

GALVANISM.

Galvanism is a continuous positive or negative current whose polarity effects cause electrolytic or chemical change. The current is followed by nutrition or destruction depending on the strength and method. Batteries of high efficiency for the desired milliamperage are preferred unless a generator is available, free from the fluctuations of street current. The rheostat reads 0 to 20 and the milliamperemeter, from 0 to 70. Insulated electrodes are used. The negative pole (because relaxing) is in the rectum for acute conditions but the positive pole (because stimulating) is used for relaxed conditions, while a moist pad about six by four inches is on the pubic region under a sandbag. The strength is up to 10 milliamperes for acute and from 20 to 70 milliamperes for subacute or chronic conditions, beginning low and ascending, with sensations but without pain. The current should never be used without a meter. The duration is from fifteen to thirty minutes. Weak currents with maximum duration are superior to strong currents with minimum duration. The frequency is alternate days and the results are determined by the positive (acid) or negative (alkaline) polarity. The electrotherapeutic alternate is the Oudin current through the high vacuum glass electrode. The physical adjuvants are hot and cold hydrotherapy and phototherapy for circulatory stimulation or sedation on the following day as needed. Digital massage is not advisable.

Urology of today requires interrupted galvanism in prostatics: First, the relief of congestive states in nonoperative treatment or inoperative cases as an alternate or substitute for other modalities; second, restoration of postoperative atony or damage of the muscle wall and sphincter. These aims are identical with those of neurologists in the muscle lesions of neuritis, paralysis, and surgical injury.

IONIZATION AND WATER ELECTRODES.

Ionization and water electrodes belong under galvanism produced and regulated as stated under that subject. The electrodes are urethral, insulated down to the last inch. The negative of copper or zinc is placed in the urethra while the large positive pole is on the pubic region. The current (continuous, never interrupted) should cause no muscular contraction but only mild warmth under a range of from one to five milliamperes. Treatments last from five to ten minutes, on alternate days, and relieve subacute and chronic engorgement. The electrotherapeutic alternates are diathermy to increase the efficiency and the wave current to produce tissue contraction. Digital massage and hot or cold hydrotherapy are omitted. Phototherapy almost equals diathermy as an adjuvant.

In urology mild ionization is useful in granulations and edema of the prostatic urethra. The zinc urethral electrode on the negative pole is used for subacute conditions requiring relaxation and on the positive for chronic lesions requiring stimulation. Oxychloride of zinc reaches the deep tissues for nearly 0.5 cm. The current should be three milliamperes and its duration five minutes. The polarity should be reversed from the positive pole so that the relaxing negative pole will relieve adhesions and avoid trauma. Ionization should be the last modality tried by the novice after he has learned all others.

SINUSOIDALISM.

The sinusoidal current is a slowly rising and falling continuous current reversing its polarity at the end of each cycle. It alternates contraction and relaxation of both striped and unstriped muscle. The wave must agree with the heart rate for greatest benefit in the muscle substance or organs like the prostate containing muscle. The source is faradic current and galvanic current from the appliances already detailed, each being used alone or both in combination. Therefore all details are the same as to rheostat, milliamperemeter, strength of both forms of current, electrodes and their placing. The sine wave agrees with the pulse or is directly proportional therewith, such as half rate or quarter rate. The sinusoidal controller reads from 0 to 10. The strength of current is, as in galvanism and faradism, determined by the contractions, sensations and meter. The duration of treatment is from twenty to thirty minutes without weariness and the frequency alternate days. The effects of the faradism and galvanism are the same as those for each current separately except that the sine wave of the galvanic current affects the unstriped as well as the striped muscle, whereas faradism affects only the striped muscle. The physical adjuvants are hot and cold hydrotherapy and phototherapy exactly as just stated. Digital massage is not advised.

Up to date urologists may use galvanic sinusoidal in the same cases as are noted under interrupted galvanism. The sine wave corresponds very well with the manual or metronomic interruptions spoken of under galvanism.

STATIC WAVE CURRENT.

The static wave current has high voltage, initial low amperage and pulsatory effects. It is a capacity discharge of an unidirectional current, and disperses rapid electrophysical effects in the part. Contractions occur in all contractile tissue and even in cell protoplasm. The apparatus is a motor driven, multiple plate static machine of sufficient capacity, with a rheostat with many stepups and a milliamperemeter. The wave current is one of high voltage and fractional milliamperage. The electrode is of insulated metal tip prostatic type applied to the gland for the wave current from the positive pole or the high vacuum glass electrode for the actinic influence of the negative pole. The current produces contractions tolerable to the patient. The sparkings are 60 to 120 a minute. The frequency of treatment is alternate days given from twenty to thirty minutes and the immediate results are without discomfort. The electrotherapeutic alternates are the high vacuum tube and diathermy and phototherapy—the last two being similar. Digital massage, hot and cold hydrotherapy, are of doubtful value. In prostates whose acini fill up and discharge periodically, digital massage is a required adjuvant.

The static wave current has made good for about twenty-four years. The indications are not wholly standardized and authors differ somewhat in distinguishing between the static wave, static induced and high frequency current. No good classification of cases, reports of cases and cystoscopic diagnosis before treatment or after treatment are given. Hence a valid element in the diagnosis is omitted and much of the work is open to question and even rejection. In the matter of classification at least infected and uninfected cases should be recognized. The static wave current in urology is valuable for congestion, relaxation and edema of the prostate in all functional disorders associated with hypertrophy. It has no influence in true hypertrophy or neoplasm.

HIGH FREQUENCY CURRENTS.

High frequency and alternating current are synonymous terms, applied to rapidly oscillating current converted into heat by resistance overcome and by molecular activity excited in living tissue. Local and general diathermy are only manifestations, hence a definite quantity of heat may be developed in a part such as the prostate. The heating is vascular, nutritional and relaxing.

The source is a standard transformer delivering high potential current energized by a motor generator of not less than two kilowatts capacity. The portable apparatus sold in drug stores is useless because it deceives the public and the profession. The rheostat is the multiple sparkgap type and the switch has five stops. Each device regulates respectively the voltage and amperage. The meter reads 0 to 2500 and is of the hot wire type. The electrodes are of the high vacuum glass type for the Oudin current in rectal or urethral prostatic work; or the insulated tip rectal electrode with the large metal pad on the pubes if diathermic current be employed. The current (always continuous) should produce only a mild warmth. The milliamperemeter registers from 200 to 1000 milliamperes within tolerance. Treatments persist from ten to twenty minutes, on alternate days, and decongest the gland remarkably.

In modern urology diathermy is used to increase healthful hyperemia and nutrition whenever any other modality might be used. It therefore augments the action of any other modality if used first. General diathermy or autocondensation in prostatic lesions promotes absorption and elimination.

X RAY.

The x ray is stimulating or inhibiting according to dose. The stimulating dose causes hyperemia and cell action while the inhibiting dose produces tissue contraction and cell decline. These are the bases of action in prostatic cases. Hemorrhage may be controlled with the x ray. The source may be the static machine or the transformer. The static machine seems to have the advantage of about127,000 volts when the standard ball terminals (0.866 inch in diameter) are 15 cm. apart according to Harris and Reiss, both noted and independent investigators. Such voltage gives greater penetration than that from a transformer having greater amperage but lower voltage. X ray treatment with the static machine for thirty minutes at 2 to 2.5 milliamperes thus delivering seventy or seventy-five milliampere minutes may be more serviceable than treatment by a transformer delivering 10 milliamperes for two to two and a half minutes, in total 20 to 25 milliampere minutes under considerably lower voltage and lower penetration but higher burning powers. This comparison is probable but is still under study. The x ray tube vacuum should back up a five inch spark gap between the ball terminals. This gap is equal to a ten inch distance between the pointed terminals of the transformer machines. A transformer with standard ball terminals will deliver about the same voltage but the higher amperage is almost sure to burn the patient. Burns with the static machine are rare, when compared with remarkable results.

CONCLUSIONS.

Electrotherapy is by no means a cureall in urology. Improved appliances, better diagnosis, finer selections of cases, lead to better recognition of its value.

Like all other measures its results are not constant in that sometimes it fails where success is expected and succeeds where this outcome is not looked for. A modality will benefit a given lesion in several patients and give little result in another group having apparently the same lesion. These patients in turn will accept a modality not usually employed for the same purpose.

After about eight years of careful study and work I am of the opinion that electrotherapeutics has a definite application in urology. It is by no means consistently positive and has its contradictory failures exactly as all other methods of treatment have had, do have and will have. It possesses one unquestionable advantage, which is that it does not add to the destructive process of the disease unless inexcusable blunders are made. Further without doubt it creates a healthy circulatory condition deep in the affected part, probably both through a local tissue and peripheral nervous influence. Unlike the average local application it does not cause exfoliation of epithelium and thus add to a process already existing as in gonococcal infection.

In acute infections when the mucosa is so irritable that no instrument may be inserted only the external forms as in x ray and radiant light and diathermy are possible.

In subacute conditions especially when instillations are employed in common practice the negative pole of the static machine and the high frequency current of mildest possible strength are of great value. Always the glass tube electrode with the vacuum exhausted to the first x ray degree must be applied otherwise disappointing results will ensue. These details work out remarkably in curing the damaged mucosa after severe mercurochrome and acriflavine applications.

Where massage influence is called for the positive pole of the static machine is in order or the mild sinusoidal current combining faradism and galvanism.

Where dilatation is required, as in stenosis of the uterine os or in urethral stricture, the negative galvanic pole is very valuable. When stimulation and mild caustic action are sought for, then the galvanic positive pole is used cautiously.

For penetration of various medicaments—notably copper, zinc and iodine—ionization is the method. The copper and zinc must be attached to the positive pole and iodine to the negative pole. Too much caution can not be used with ionization until real skill is established.

Electrotherapy cannot be learned in a short time but it will reward all the time and energy employed both in learning and in applying it. With the caution and limitations indicated herein I recommend it highly.

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45 WEST NINTH STREET.

Physiotherapy in Orthopedics*

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Physiotherapy in orthopedics has been used successfully and extensively during and after the world war in military hospitals and government institutions. The following information is based on an experience of six years in military orthopedic work with a close follow up of patients receiving physiotherapy. This work started in the British war and base hospitals and was followed continuously in U. S. Army hospitals, U. S. Public Health Service hospitals and finally in the U. S. Veterans' hospitals and clinics. The past two years have been wholly devoted to general physiotherapy. I am convinced that modern scientific physical modalities, properly combined with orthopedic surgery and prosthesis, is now an important part of the orthopedist's armamentarium.

The large number of orthopedic disabilities resulting from gunshot wounds and other injuries among service and exservice men presented difficult tasks to solve. It was largely through the medium of physiotherapeutic modalities that these complicated disabilities and marked deformities were successfully treated and maximum improvement given. It certainly can be said that physiotherapy in conjunction with modern medicine and surgery has been a big factor in rehabilitating our maimed exservice men so they could become useful citizens, successful in various callings. Since space does not permit of individual case reports with progress notes and results, consideration will be given here to the *modus operandi* of the different physical modalities, the technics used, the action and reactions on tissues and the kinds of cases successfully treated.

We have at our disposal such physiotherapeutic means as massotherapy, thermotherapy, hydrotherapy, radiotherapy, actinotherapy, electrotherapy and mechanotherapy.

In the application of these classes of remedies, it is well to consider the various types of inflammatory reactions. Inflammation, as we all know, is nature's effort at preventing and repairing damage done or in the process of being done by an irritant in the living tissues of the body. There are three stages of inflammation, adequate, inadequate, and excessive. When the reaction is an adequate inflammation, recovery occurs by resolution. An inadequate inflammation is a progressive acute, subacute and ultimately a chronic inflammatory process or disease condition. An excessive inflammatory reaction is an acute form of inadequate inflammatory reaction occurring less frequently and producing stasis, necrosis and granulation tissue. The application of physical therapeusis to the body is effective only as it controls inflammatory reactions. It is of the utmost importance to make an accurate diagnosis of an existing condition, for this purpose utilizing x ray and laboratory findings, together with all necessary clinical evidence pertaining to the case before instituting physiotherapy. Several different physical treatments should be properly combined in sequence to produce a cumulative effect; single treatments prescribed at infrequent intervals are only mentioned to be condemned.

The oldest, most widely known and used modalities are, massage and radiant light and heat, wrongly known as baking, the latter term almost entirely discarded in recent years as being inappropriate and misleading. Manual massage with its sequence of movements includes active, passive, assistive and resistance exercises, special manipulations, remedial and corrective gymnastics. Following orthopedic operations, major and minor in character, the value of radiant light and heat and massage can not be overestimated. It can be applied in conjunction with the wearing of splints and bivalved casts, that can be removed for treatment and reapplied immediately following application. Radiant light and heat implies use of different styles and sizes of radiovitant applicators and deep therapy lamps. These applicators are equipped with four or more carbon or Mazda bulbs of 60 to 150 watts each, depending upon the part treated and the action desired. This form of convective heat produces a superficial hyperemia, thoroughly warms the superficial tissues and relaxes tense musculature, preparatory to massage and other treatments. It has marked derivative effects for relief of pain and irritation in neuritis, myositis and fibrositis, that often accompany conditions of an orthopedic nature.

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Where there is pain, congestion and swelling after operations, the deep therapy lamp with its 1500 watt cobalt blue bulb filtering out many of the long heat rays has a decided sedative effect on the tissues, producing a deep, effective hyperemia to relieve the localized congestion. It also relieves pain by lessening nervous sensibility and regulating functional activity of the tissues. Heat produces a reflex effect upon blood supply, now well understood, various superficial and cutaneous areas reflexly related to deep internal organs being favorably influenced accordingly. Where there is superficial infection, unhealthy and unhealed scars, with draining sinuses in situ, the actinic rays are used, following deep therapy radiation, for bactericidal and healing action. The action of actinic irradiations has been found to be greatly and remarkably beneficial in active tuberculosis of bones and joints. Massage and exercises should follow radiant light and heat and deep therapy applications, to reduce swelling and congestion by stimulating circulation and absorption, and relaxing contracted and spastic musculature. The applying of suitable supports is necessary after treatment for some of these patients. Fractures should receive treatment as early as possible by radiant light and heat or hot whirlpool baths followed by light massage of the part. Muscles above and below the site of fracture are then to be treated, but no movements or exercises allowed for the first days. The employment of movements and exercises is to be guided entirely by x ray findings and the progress of the case, but should be started sufficiently early to obtain complete function in the minimum of time.

In case of flail joint, where operative procedures are contraindicated and after repeated attempts by surgical repair fail to be successful, the use of massotherapy with selective exercises and movements persistently and judiciously applied to muscles acting on the joints steadily increases function in the extremities. The development of muscle power and gradual increased range of motion in such a case, surprising to say, often gives an extremely useful extremity. The use of simple mechanotherapy also aids in muscular reeducation and in function of disabled joints.

Corrective exercises and remedial gymnastics are valuable adjuncts in treatment of functional scoliosis, lordosis and static strains of the back with postural defects.

Mechanotherapy is a valuable physical means for muscular reeducation, development of power, coordination and mobility of joints, following injuries and gunshot wounds with impaired function of muscles and joints.

Massage of amputation stumps should be started as soon as scars are healed, but should always be preceded by radiant light and heat or hot whirlpool baths. The massage at first must be light, increasing as the tolerance of the tissues permit. Exercises are valuable, active and passive movements being absolutely necessary to prevent deformity with limitation of motion and atrophy of tissues from disuse. As much pressure and force as is bearable should be made to end of stump to lessen liability of exostosis formation. These factors are all important to render the stump suitable for weight bearing when an artificial limb is supplied.

Mechanical vibration is a useful modality. It gives a regular stroke with deep massage and percussion effect and is more efficient than the manual massage in certain body regions. Vibration to the spine is particularly effective in many forms of backache, lumbago, sacroiliac and lumbosacral strains, with chronic myositis and neuritis. These conditions should first be treated with diathermy or the deep therapy lamp before vibration is applied.

It is important to give each treatment for a sufficient length of time to produce good results, and for this reason (of course, with certain exceptions), the average treatment period is twenty minutes. This is really a short intensive application, but longer treatments are sometimes necessary to produce the effects and reactions desired. Treatments of short durations are to be condemned as needlessly prolonged and unsatisfactory in the end.

Local hydrotherapy is administered by submersion of the extremities in the latest designed arm and leg whirlpool baths, these being equipped with the adjustable ejector and aerater. The nature of the cases benefited by this form of treatment are gunshot wounds of the extremities, recent fractures, joint injuries, painful amputation stumps with swelling and edema, adherent, painful scars, nerve injuries with peripheral paralysis and neuritis. The importance of the whirlpool bath in these conditions cannot be overestimated for the following reasons: It gives a gentle, soft, soothing massage to the affected areas; relaxes muscle spasm; reduces edema and also effusion of joints; relieves the pain about adherent scar tissues; produces a sedative effect to nerves and increases local circulation, thus relieving cold, sweaty, cyanosed conditions of extremities. This treatment has been found to be of great benefit in pes planus and allied disabilities of the feet, as a preliminary treatment before receiving massage, forcible exercises and manipulations. It also increases the conductivity of the tissues to electrical currents; this, in my experience, materially hastens muscular response to galvanism and sinusoidalism in old peripheral nerve lesions with partial or complete paralysis.

HIGH FREQUENCY CURRENTS

Entering upon high frequency phenomena it is well to understand the oscillatory character of the condenser discharge. This is brought about by the sudden disruptive discharge causing a breaking down of the cohesion between the particles that are expelled in a diffuse oscillatory manner across the spark gap, which controls the current flow.

Diathermy (thermopenetration), a direct form of high frequency current of high amperage and relatively low voltage, is obtained from the d'Arsonval or bipolar current of a high frequency machine. This form of deep heat penetration can be given in two ways, sedative and stimulative. Experience has shown that it is the treatment *par excellence* in bone and joint diseases and injuries.

Sedative diathermy, the type usually indicated, is where a long continuous steady heat is driven through an affected part usually to the tolerance of the patient. The amount of heat varies with the resistance, time of application, part treated and size of electrodes, bone structure giving the greatest resistance. The current is stepped up from and down to zero gradually, allowing five minutes to reach the maximum and five minutes to be reduced to zero. The average duration of treatments should be about twenty minutes, in some cases longer, but almost never shorter.

Stimulative diathermy is much less frequently used, chiefly indicated and used successfully in promoting callus formation in sluggish healing fractures and in gunshot wounds where there is loss of bone substance. In this form of treatment the current is stepped up rapidly and reduced abruptly by closing the spark gap suddenly. The object being to stimulate and irritate the bone substance by short intensive flow of current to produce osteogenesis. The treatment should require only one third the time and about one third the dose of a sedative treatment.

The effects of diathermy vary as to the time of the application for an effective dose. It varies directly as the square of amperage; for example, by raising the amperage from 250 milliamperes to 750 milliamperes, which is three times the amperage, but is nine times as much heat produced in the tissues. It varies as to the resistance of the part treated; the more dense the tissue, the greater the resistance. The smaller electrode surface is active; the larger electrode surface is inactive. This is brought about by the current being concentrated from the large electrode on to the small electrode with great heat formation and the current from the small electrode is diffused onto the large electrode with less heat formation. In electrodes of the same size the maximum degree of heat is half way between electrode surfaces. The skin is little affected by the passage of the current in diathermy, the heat concentrating in the bone and deeper soft tissues. Do not use more than 1000 milliamperes to each sixteen square inches of electrode surface. The tension for therapy ranges above 10,000 volts with a frequency of above 200,000 oscillations a second: The frequency must always be over 10,000 a second to be safe: an alternative current under this figure will cause tetanic contractions of the tissues. The electrode material is a composition lead and block tin, 50 per cent. each, 22 gauge, known as Crooke's metal; it is easily cut and shaped for areas to be treated. The best clips used to connect rheophores to the d'Arsonval binding posts are of the Fahnestock type, any style being used. The electrodes are applied by either the cuff or plate method, the size and shape depending on the part to be treated and the nature of the existing pathology. Soaping of electrodes for treatment and similar preparation of the skin over the part to be treated should always be carefully done to insure accurate contact. This makes the difference between a pleasant, efficient treatment and a burning, stingy and occasionally shocking, ineffective application. The electrodes, selected for the part to be treated, are placed in warm water for a minute or two, during which time the skin over the area to be treated is thoroughly moistened with soap and water. The surface of the warm electrodes to be applied to the skin is now thoroughly moistened with soap and water and applied over the prepared area of skin. Always be sure that the electrodes are in perfect contact with the skin and fit in perfect coaptation over bony prominences. This is necessary to prevent the jumping or arcing of the current from the edges of the electrode to skin, as this would produce a disagreeable, prickly, burning sensation with subsequent development of a burn.

In treating joints of the hands and feet diathermy should be given by placing the hand or foot in a small amount of salt water in a suitable white enamel basin. This method has proved to be more efficient than by applying the electrodes to the smaller joints where only a minimal amount of current could be given; even then there is great likelihood of the current arcing and producing a burn. When treatments are given to the arms and the legs in salt water, one electrode is placed in the water and attached to the rheophore: the other electrode, in form of a cuff, is placed above and around the wrist or the ankle joints, connections to the machine being made as usual. This form of application permits of sufficient milliamperage to obtain effectual results and further use permits of concentration of current to particular affected digits by raising other digits out of the water leaving the affected one to receive all the current. When all digits are affected, alternate the concentration of current by lifting first one and then the other out of the water. A small amount of water to cover fingers or toes is all that is necessary, too much water making the resistance too high.

Among the important actions of sedative diathermy on tissues are: produces heat in accordance with the resistance of the part; increases the local blood supply; dilates the arterioles and produces hyperemia of deep tissues and bone substance; disintegrates organized or partially organized articular and periarticular exudates; dissolves excessive, painful callus formation and breaks up fibrous ankylosis and adhesions; it is a decided sedative, relieving acute pain in myositis and neuritis; finally, it relaxes tense and spastic musculature.

The nature of lesions materially benefited by diathermy includes all types of gunshot wounds with fractures followed by subsequent deformities of bone and joints: panfibrous and hemifibrous ankylosis of joints with articular and periarticular adhesions and exudates after long immobilization in splints and plaster casts; acute and subacute articular rheumatism and all arthritic conditions with deformity and limited range of motion; acute sprains and strains of joints; hypertrophic and rheumatoid arthritis (these being benefited partially, depending on duration and extent); traumatic myositis and neuritis accompanying joint and bone injuries; bone infections, chronic osteomyelitis, osteitis and periosteitis.

Diathermy has a markedly relaxing effect on ligaments, muscles, and joints, thus preparing them for massage, active and passive exercise with forcible bending, stretching and special manipulations. It is indicated in joint pathology with diminished range of motion. Sacroiliac injury, with slipping of the joint and consequent strain, is successfully relaxed and the joint manipulated back into position.

The crossfire method of diathermizing joints is used by me with notable success. It is a method of particular value in knee joint disabilities. The technic of this method is carried out by the sequence of four different applications of electrodes as follows: The first treatment is given by the cuff method, cuff electrodes being placed around the leg just below the patella ligament and around the thigh just above knee joint articulation. The second is carried out by placing plate electrodes above and below the knee diagonally opposite each other. The third treatment is given by reversing the electrodes and in the fourth and last application, the electrodes are placed one over knee cap and the other in the popliteal space. The duration of each application and treatment is twenty minutes; this is repeated as often as indicated, but alternate days should suffice in the average case. The seance is repeated until maximum benefit has been attained. This thorough diathermizing of a joint gives satisfactory results where there is a diffuse articular and periarticular arthritis and fibrosis with effusion and pain. It must always be remembered, in the application of electrodes, that the smaller active electrode is placed over the site of greatest disability with the larger inactive electrode diametrically opposite. This plan brings the involved area between them with edges far enough apart to prevent arcing of current from the electrodes. Diathermy of areas should always be followed by either massage and exercises, sinusoidal wave, rhythmic faradic or static wave or sparks and brush discharge. This combination with any of the above modalities hastens absorption, decongests the tissues, relieves pain and gradually restores the tissue to normal consistence, hastening the return of normal function. Diathermy is contraindicated where there is walled in pus, likelihood of hemorrhage, active tuberculosis of bones and joints and in malignancy.

The unipolar or Tesla current from the high frequency apparatus is used occasionally in cases of an orthopedic nature in conjunction with other modalities. It is a current of high voltage and relatively low amperage, being given in two forms, sedative and stimulative, with vacuum and nonvacuum electrodes. The nonvacuum is preferred and is four times more efficient. The sedative form is given with a mild current with the electrode touching and moved slowly over the surface treated. The stimulative form is given with more current and with the electrode raised one to three inches above the surface treated, producing a sparking effect, the intensity of which varies with the condition. The combined sedative and stimulative treatment is particularly useful in phlebitis, venous stasis, varicose veins and ulcers and in trophic abnormalities of the extremities. The sedative form, as the name implies, relieves pain and produces superficial hyperemia. The stimulating form decongests and relaxes superficial tissues and increases circulation by its sparking effect.

Static electricity or the frictional current is of extremely high voltage and extremely low amperage. The three modalities extensively used in this form of treatment are the static wave, sparks, direct and indirect, and static brush discharge. Static electricity is essentially mechanical inaction, but also has some electronic action in the tissues. The principal indication of this type of current is to relieve pain by decongestion of tissues produced by an even molecular electronic massage. The socalled hookups for the different modalities of the machine vary according to different authorities. I use the following technic and have found results satisfactory: the patient is seated on an insulated platform, the negative pole of the machine being grounded, and, if using the wave treatment, is connected to the positive pole. For both the static sparks and the brush discharge, the patient is connected to the negative pole of the machine, the positive poles being grounded: the spark ball or brush instrument and the operator are grounded, and I advise attachment of the Leyden jars in the wave treatment and also when the sparks are not sufficiently strong.

In cases with localized pain and swelling, the wave treatment is especially indicated, but the area should be diathermized beforehand to soften any organized or partially organized exudate or congestion. Method of application: An electrode of 22 gauge Crooke's metal, cut exactly to fit the area, is bandaged on and connected with positive terminal of machine. The contractions should be limited to three or four a second, to permit of full relaxation between each contraction of the tissues. When the area of pain and congestion is more diffuse as, for instance, a sciatic neuritis affecting the entire course of the sciatic nerve, the sparks are given up and down the nerve course, light at first and gradually increasing to tolerance. This is followed by the static brush discharge (pencil effleuve) that has a sedative and decongestion effect. In sciatic neuritis the wave should be given first over the sacrosciatic notch and then followed by the sparks and pencil effleuve as stated. above. The time of treatment should be from ten to thirty minutes, depending on the condition of the part treated. This permits ten minutes for each modality in sequence, wave, spark and brush discharge, the preferable technic. Longer duration of treatment is necessary when only a single modality is given. The nature of cases responding to these modalities are acute sprains and strains of all joints, joint effusion, synovitis, bursitis, sciatica neuritis, chronic myositis and neuritis of all types. Treatment should always be preceded by some form of heat, preferably diathermy or deep therapy.

My desire in this article is not to hail physiotherapy as a panacea but to emphasize the efficacy and potency of physical forms of effective therapeutics, scientifically applied in orthopedic conditions.

Physiotherapy in the Medical Department of the United States Navy

By ERIK G. HAKANSSON, M.D.,
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In the naval medical service, physiotherapy now includes massage, medical gymnastics, hydrotherapy, radiant heat and light therapy, actinic ray therapy and electrotherapy.

In the term medical gymnastics are included all the methods of systematic exercises of the motor apparatus for therapeutic purposes. Both the manual and the mechanical methods are used. Games and sport and occupational therapy are also utilized. In hydrotherapy, applications of practical nature and known effect are used, such as the ablution, the sheet-bath and the cold friction bath, the cold pack and the continuous bath, the circular douche, the jet and fan douche, whirlpool baths and fomentations. Radiant heat and light are applied by means of different types of incandescent lamps and by electric light bath cabinets. For actinic ray therapy, the mercury vapor quartz lamps and other arc lamps are utilized. Direct sunlight is also used. In electrotherapy use is made of the galvanic, faradic and sinusoidal currents and the various modalities of the high frequency current and static electricity.

In the latter part of 1919 a separate department for physiotherapy was established at the Naval Hospital, Brooklyn. A complete equipment was acquired. Navy nurses and hospital corpsmen were trained as operators and a high standard of skill was soon attained. The hospital staff found physiotherapy a valuable aid in the treatment of a great variety of injuries and diseases and utilized it to its full capacity. During the three years and a half that it now has been working the change from wartime to peace time conditions has occurred and an entirely new set of officers and nurses has succeeded the staff under which the physiotherapy department evolved. It is significant to note that the department still has practically the same extent of usefulness. This bears out the assumption heard from various sources nowadays that the utility of physiotherapy is not restricted to the functional restoration of maimed victims of war injuries, but that it should be regarded as a fundamental branch of medical and surgical treatment in time of peace as well.

The Bureau of Medicine and Surgery is now realizing a plan to place physiotherapy at the command of all naval hospitals. Three naval hospitals, besides the Naval Hospital, Brooklyn, have now physiotherapy departments in commission and within the next six months five additional hospitals will be equipped and provided with trained personnel for this method of treatment.

The Navy does not employ reconstruction aides as operators in physiotherapy, but trains its own personnel, nurses and hospital corpsmen, for this purpose. This training is carried out at the Naval Hospital, Washington, D. C., where a physiotherapy department, with special advantages for training of personnel has been organized. The minimum time for the course of instruction is four months. The aim of this training of the nurses is to make them skillful technicians capable of intelligent application of physiotherapeutic measures, at the direction of medical officers. The hospital corpsmen are expected to meet these requirements only in hydrotherapy. Their training in the other methods of physiotherapy is considered satisfactory when they can work as reliable assistants to the nurses.

Physiotherapy has also been placed on the curriculum of the Naval Medical School. The course includes eight lectures with clinical demonstrations and eight hours of practical work. The training of the personnel and the instruction at the Naval Medical School are in charge of medical officers who have had special experience in physiotherapy, and who have been afforded ample opportunities for study.

Through this system of instruction, the peace time Navy will soon have most of its medical officers familiar with the principles and indications of physiotherapy and a number of medical officers will have special knowledge of the subject and considerable experience in the training of operators. Furthermore, there will be many nurses particularly skilled in the application of the various modalities of physiotherapy, and a considerable number of hospital corpsmen sufficiently trained to work satisfactorily under supervision. It is obvious that these conditions will permit of a quick and easily accomplished expansion in case of a war emergency. By merely placing the above mentioned medical officers in charge of the various physiotherapy departments, each naval hospital can be made a training unit capable of supplying its own needs in physiotherapy personnel. With trained personnel available, the problem of expansion is practically solved. Other necessities, such as additional space and more equipment would be less urgent, since, undoubtedly, the skillful human hand working intelligently is the most important instrument.

The Employment of Some Forms of Electricity in Cardiovascular Diseases

By EDWARD C. TITUS, M.D.,
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Realizing that in the treatment of cardiovascular conditions electrotherapy constitutes only one of the many remedial agents, I shall limit myself in this brief paper to a discussion of the uses and indications of the different electrical modalities. I have therefore omitted any reference to the other important elements to the treatment, such as diet, exercise, general hygiene, hydrotherapy, and the administration of the various medicinal remedies.

Circulatory disorders, as commonly encountered, may be divided into local arterial spasm, general hypertension, low arterial tension, abnormal relaxation of peripheral bloodvessels, and changes in cardiac rhythm. These may occur in the course of valvular lesions, hypertrophy or dilatation of the heart, or of cardiorenal disease. I shall describe briefly the action of the various currents and indicate the conditions in which they are chiefly applicable.

HIGH FREQUENCY CURRENTS.

The commonly termed high frequency electrical current and its two important subdivisions, local and general diathermy, may be briefly defined as very rapidly oscillating currents which are converted into heat by the resistance they encounter and the molecular motion set up in the living tissues. The newer type of high frequency electrical apparatus enables us to introduce heat even into the deepest structures, and this too in a definite dose. When diathermy is applied in sufficient quantity to the heart and greater bloodvessels in cases of hypertension, the first effect observed seems to be upon the vasomotor nerves, evidenced by relief of vascular spasm and an equalization of the circulation, with increased elimination of toxic gases and solids from the fluids of the body. This is shown by the emanations from the skin and mucous membranes and by the increase of toxic products found in the urine after each treatment. One can readily appreciate the advantages of this procedure even in cases where extensive changes have occurred in the bloodvessels.

From a report on high frequency currents read by de Kraft before the American Electrotherapeutic Association (1) we quote: "High frequency currents enable us to raise the blood pressure when too low, as well as to lower it when too high. We know that there exist both vasoconstrictor and vasodilator nerves. It appears certain that as the result of a variety of toxic products generated in the human body, we may have either an irritation of the vasoconstrictor or of the vasodilator nerve.

"The first effect of the great rapidity of the succeeding groups of oscillations is an intense heating of the surface of the body and of the blood. This, in turn, stimulates the great system of vasomotor nerves, resulting in peripheral dilatation of the bloodvessels, and, at the same time, in stimulation of the sweat glands. It would appear that the sympathetic nervous system is stimulated in a most profound manner."

The effect of high frequency currents on the sympathetic nervous system is well illustrated by observations made by Sherbak (2). He employed diathermy by means of two electrodes with a combined area of 57.5 square cm. The upper electrode was applied to the upper cervical vertebræ and the lower to the middle dorsal. From five hundred to seven hundred milliamperes were passed for five or six minutes. In a case of severe headache which accompanied right sided hemiparesis, hemianopsia with atrophic changes in the eye grounds and loss of hearing, twelve to fifteen applications relieved the headache. In another case of cerebral syphilis ten applications relieved the headache, hyperemia and the noises in the ears, and restored the patient to working capacity. It is interesting to note that the Argyll Robertson sign, which was present, disappeared after the treatment.

Equally good results were obtained in fifteen cases of functional disorders accompanied by circulatory disturbances in the head. In the majority of cases, the blood pressure, when above normal, was lowered after each treatment, and remained so after a number of applications. This author cautions against prolonged treatment in view of the marked circulatory changes produced in the cerebral circulation, which, he maintains, may cause anemia of the brain, low blood pressure and excitement. In my experience these symptoms do not occur if the diathermy is applied directly through the brain. The value of diathermy in arteriosclerosis of the brain is remarkable and permanent benefit has been noted.

Numerous observations enable us to assert that a normal blood pressure in an otherwise healthy person is never influenced by high frequency currents if employed in moderate doses.

GALVANIC CURRENT.

This is a continuous flow of energy producing polarity effects by which it causes electrolytic or chemical changes. The latter changes may be nutritional or even destructive, depending upon the method and degree of application. The passing of the continuous current of five to ten ma. through the brain for prolonged periods at each treatment has been followed by marked nutritional improvement in both the objective and subjective symptoms which so commonly follow profound cerebral changes, and when this modality is preceded by local diathermy for twenty minutes the effects seem to be greatly intensified. Because of the pronounced beneficial nutritional changes induced by this combination of electrical forces, their employment in hypofunction of the liver, kidneys and the endocrine system will be found most helpful. The prolonged use of mild galvanism for one half to one hour, supplemented by diathermy, is the approved treatment for inducing absorption of retinal hemorrhage, as well as the cerebral changes associated with the slow and often incomplete recovery from apoplexy.

FARADIC CURRENT.

The Bergonié method of treating obesity is the application of the induced current from a high tension faradic coil with comparatively slow vibrations which are tuned to the rate of muscle fibrillation of thirty a second, and administered in surges at a frequency to correspond with the heart impulses. In some patients with rapid heart action the contractions are slowed to every second heart beat. This procedure is a particularly serviceable and safe means of treating muscular weakness associated with obesity and cardiovascular changes. For further information concerning this method I would refer you to a recent article of mine which embodied my experience in the treatment of obesity (3).

THE SINUSOIDAL OR RHYTHMIC WAVE CURRENT.

This is a slowly swelling, unidirectional, continuous electrical discharge, which reverses its polarity at the completion of each cycle. It produces alternate contraction and relaxation of both striped and unstriped muscular fibres, and when these effects are regulated to correspond with the frequency of heart action, the nutritional changes in the muscular system are greatly influenced. In gastrointestinal dysfunction, associated with cardiovascular disorders, this dependable current will help to correct some of these disturbances through the removal of effete material, and the improvement in the intraabdominal pressure resulting from the increased tone produced in the abdominal viscera and muscles of the trunk.

STATIC WAVE CURRENT.

This current is a pulsatory high voltage electrical discharge with an initial low amperage. It can also be defined as a capacity discharge obtained from a unidirectional source of energy. Because of its high voltage, low amperage, and the wide dispersal of its pulsatory discharge throughout the body, the static wave current enables us to produce rapid electrical and mechanical variations in the human system. Both physicists and physiologists have determined that this current induces tissue contractions in all structures which are capable of contracting, and even in the protoplasm of the cell. In conditions of hypotension, with or without engorgement of liver, spleen or kidney, the static wave current will effect a more normal distribution of the blood by the vibratory effect set up in the cells of the body and the removal of venous stasis of the liver, spleen and kidneys.

In conditions of low blood pressure, we can raise the tension by stimulating the end organs of the sensory nerves by means of the wave current or the resonator effleuve, preferably from a static machine, or by rapidly rubbing a glass vacuum electrode attached to the Oudin resonator over the surface of the body. Whatever static method we employ to achieve our object, we notice, almost invariably, that as the circulatory disorder improves the mind clears, ideas flow more freely, and there is an increase of bodily vigor.

RÖNTGEN RAY THERAPY.

Röntgen ray therapy can be both stimulating and inhibitory in its effects, depending upon the degree of application. In small doses, which are usually followed by a reactionary hyperemia, it increases cell activity. By large doses we induce tissue contraction and inhibit cell growth through arresting the functions of the enzymes in the structures acted upon. This agent is now a recognized method of treatment in cases of uterine fibroids and enlarged prostates associated with and often a cause of, cardiovascular diseases. It may also be employed in checking the excessive activity of the adrenals.

PHOTOTHERAPY.

The general application of phototherapy consists practically in the use of the electric light bath, and since much of the benefit to be derived from this agent will depend upon the apparatus employed, I will first give a description of what has proved to me to be the most satisfactory type of cabinet.

An electric light cabinet should be constructed according to the following plan: It should be octagonal in shape, four feet square by five feet high; the lining should be of white blotter and not mirror surface; the source of light should come from one hundred forty watt tungsten lamps, conveniently arranged, so that they will be under control from within by properly placed switches, one half or the full number of the lights to be employed, as desired. The cabinet should be partly open at the top, and it should have an air vent three inches in diameter in the centre of the floor, over which is placed a low stool eighteen inches high upon which the subject is seated. (It has been found that a ventilated room is much more quickly and evenly heated artificially than one that is closed or sealed.) The further advantages of this construction, compared with the older form of closed cabinet, are that a large volume of light with a minimum amount of heat is produced in the cabinet, that the emanation of noxious gases and odors from the human body are quickly carried off, that the degree of cutaneous hyperemia and diaphoresis is much more intense, and that the usual depression and other unpleasant symptoms are entirely obviated. The chief condition in which the electric light bath has proved to be most serviceable is arteriosclerosis. In the majority of cases of arteriosclerosis in the earlier stages I have advised the regular use of these baths, with beneficial results, and I firmly believe that they have warded off the more serious organic changes which otherwise frequently ensue. The effects of the bath are:

1. To induce intense hyperemia or reddening of the skin and thus reduce the congestion of the deeper organs, which is frequently present.

2. To increase elimination by way of the lungs and skin. It has been found that during and following the bath the elimination of carbon dioxide is practically doubled, while the profuse perspiration produced carries away much toxic or poisonous material, and in that way relieves the overtaxed kidneys. As it is generally accepted that toxemia plays an important part in the causation of hardening of the arteries, the benefit to be derived from this method is readily apparent.

In conclusion, I would say that the value of electricity in the treatment of disease depends upon the judicious selection of the modalities which clinical experience has shown to be indicated in the individual case, as well as upon the proper method of employment. As pointed out, it is often necessary to combine several electrical modalities in order to obtain the desired result, and this can only be determined by a thorough knowledge of the conditions present. There is no reason why the general principles governing the use of electricity in the treatment of disease should differ in any respect from those applicable to the administration of various medicinal remedies, in regard to both physiological action and indications. Moreover, the study of the action of the various electrical currents upon the human body in health and disease is greatly simplified by the fact that we are not called upon to consider the occurrence of toxic effects and idiosyncrasies which occupy so important a place in pharmacological investigations.

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Exercise in Therapeutics

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New Haven, Conn.

There are certain fundamental factors upon which the body is absolutely dependent for its ability to function normally. Among these are rest, food and exercise. In the mode of living into which we have been forced by modern civilization none of these essential factors has been so completely modified as that of exercise. Not only both men and women, but most children have but a fraction of the exercise which their forefathers were compelled to take.

In the absence of organic disease there is direct relationship between the condition of the skeletal muscles and the tone and efficiency of the heart and nonstriated musculature of the gastrointestinal and vascular systems. Proper exercise of the larger muscle groups influences directly the adequacy of respiration, the cerebral and systemic circulation, intestinal elimination and the ability to maintain that good posture which aids the body in functioning efficiently as a machine. The direct relationship between exercise and muscular power, the mobilization of joints, and relief of lymphatic and venous stasis is clearly apparent.

Quite recently G. O. Broun, of the Rockefeller Institute, has demonstrated that exercise stimulates the hematopoietic system to greater activity as shown by the increased number of reticulated erythrocytes after exercise in animals unused to it. In his investigation muscular training seemed to increase greatly this function of the bone marrow.

A broad view of any phase of therapy must include the prevention as well as the treatment side of the story. It was but a comparatively short time ago that therapeutic exercise, especially when accompanied by massage, was regarded as an almost complete field of physical therapeutics. The Swedes particularly have developed this type of treatment. In the hands of a well rounded physiotherapist today scarcely a condition would be treated by these means alone. Other forms of physical therapy, such as radiant light and heat, ultraviolet light and the various modalities of electricity, would be blended with these measures in obtaining the quickest results.

Exercise was one of the first physiotherapeutic measures to arrest the interest of medical men in large numbers, which accounts for its common recognition by the profession today. William G. Anderson, of Yale; D. A. Sargent, of Harvard; R. Tait McKenzie, of Pennsylvania; Jesse F. Williams, of Columbia; C. Ward Crampton, of New York, and many other medical men working in the field of physical education, have done valuable work in the subject of therapeutic exercise. Their researches however, have not been published in medical literature and for this reason a brief review of some of the principles and methods involved in exercise therapy are here presented.

Prevention includes adequate physical training for the young and the employment of sports and games suitable to various ages throughout life. The youth of both sexes must be adequately prepared to stand the severe drains on their physical reserve which the complexities of modern life have made it impossible to avoid. Postural defects of head, shoulders, spine and feet by increasing mechanical difficulties of standing and of motor activity may lead to organic lesions if uncorrected. These conditions will be considered along with curative measures in this paper. On the strictly therapeutic side we have both medical and orthopedic gymnastics. Medical gymnastics are used in the functional cardiac conditions, visceroptosis and intestinal stasis.

Tachycardia and irregularities of the heart beat not associated with organic lesions in the bundle of His were frequent in our army service work. A valuable paper on these conditions was written by my successor in the Bureau of the United States Public Health Service, Major Burt W. Carr (1).

In both of Dr. Carr's cases at Walter Reed Hospital and in the group at Cape May and other army hospitals, the old Schott-Nauheim resistive exercises were replaced by a carefully graded, slow, rhythmic type associated with the respiratory movements. The men were graded according to their initial pulse rate and cardiovascular adjustment into three groups, the first of which were given light passive or active movements, in a recumbent or reclining position. The commands were given slowly in a monotonous tone of voice and all effort was made to keep the environment free from interference and excitement. The second group were given slow coordinated bilateral movements in a standing position which were gradually increased in number, speed and vigor of execution. The third group received snappy setting up exercises and games. Pulse records were kept and the men advanced as their condition permitted.

The work of Wilson, Halsey and Barringer, of New York, has caused us to revise somewhat our fear of exercise in organic heart lesions. They found only about two per cent. of the children so affected had a poor tolerance for exercise.

Visceroptosis and intestinal stasis are treated by lateral trunk and abdominal exercise consisting of trunk bending and twisting followed by bilateral bent knee, and straight leg raising, done lying supine or from hand suspension.

In most orthopedic conditions which we are called upon to treat by exercise there is a lack of power balance in two or more physiologically opposing groups of muscles. This inequality of strength is of course normally present in several parts of the body, the anterior tibial and calf muscle groups being one example, the upper back and pectorals another. When some condition arises, such as chronic fatigue, malnutrition, too rapid growth or accumulated toxins, which cut down muscular power generally, it greatly increases the relative advantage of the already stronger group. In such conditions we find the fatigue slump, muscle bound foot, and similar defects develop. In another case we have weakness due to overstrain associated with poor muscle tone, as in the flaccid flat foot. In still another group are to be found the peripheral motor neuron lesions including infantile and traumatic injuries.

In correcting these conditions we take advantage of the fact that as the muscle strengthens, the belly of the muscle becomes thicker and the points of origin and insertion brought closer together. To accomplish this result we exercise selectively the weakened and stretched group. The physiological opponents must at the same time be actively stretched, the tone of the entire muscular system brought up to maximum and occasionally, as in the common postural defects, the muscle sense must be reeducated. With these principles in mind it is in order to consider the number of conditions in which exercise plays a leading part in the treatment.

Head forward.—Vigorous retraction of the head first as an active exercise, later resistive, by the operator standing behind patient, and exerting counterpressure on the occiput, should be instituted. The chin is thrust forward and up and the head slowly and vigorously retracted with the chin lowered. If properly done the patient will feel the muscle contraction as far as the middorsal region.

Round shoulders.—Being practically always associated with a head forward position, the exercise described above should be given, together with the following special shoulder group.

For strengthening the upper back. 1. Raise arms forward, carry sideward and lower, keeping the shoulders well back. 2. Raise arms forward, bring the hands sharply to the chest, elbows back and lower, keeping shoulders retracted. 3. Raise arms forward and carry obliquely side upward and lower. 4. Rotate the arms slowly, palms outward, forcing the scapulæ closely together.

To stretch the pectorals. 1. Patient seated on chair, hands behind neck. Operator standing behind grasps upper arm and forcibly retracts shoulders. 2. Patient's back to the uprights between stall bars, grasps behind shoulders, keeping head, shoulders and lower back against the upright, executes a deep knee bending and straightening, retaining hand grasp.

To reeducate the muscle sense. Use full length mirror to correct posture and return several times during the exercise period, teaching the patient to assume and retain the proper attitude.

Scoliosis.—To stretch the contracted muscle on the concavity. 1. Lateral trunk bending toward the main convexity, hips fixed. 2. Hand grasp in front of shoulders on stall bars or horizontal bar, legs extended to the side of the main convexity. 3. Active spine stretching to fullest extent, walk on tiptoe.

To reeducate muscle sense. Use of the mirror in assuming full height and the correction of any unevenness in the shoulder level. To increase flexibility. 1. Trunk twisting from hand suspension. 2. Trunk twisting from standing position.

Lordosis.—To stretch out the contracted lumbar erector spinæ. 1. Long sitting. Sitting on a floor or table with legs extended.

To strengthen the weakened opposing group. 1. a. From supine lying, trunk raising to sitting position. b. Double knee raising. c. Double straight leg raising. 2. a. From hand suspension. b. Double knee raising. c. Double leg raising.

Weak feet.—1. Stand feet parallel and roll out. 2. Walk forward on the outer edge feet parallel. 3. Toe in and rise on toes. 4. Walk forward on the outer edge toeing in. 5. Ground gripper walk. (Attempting to dig the toes into the rug with each step).

Muscle bound feet.—1. Stand feet parallel arms length from wall, supported by straight arms, fingers pointing inward. Bend the elbows, lowering the body forward and keeping the heels on the floor. When this condition is associated with weak feet give the socalled weak feet group omitting the exercise rising on the toes.

Peripheral nerve injuries.—Perform a few entirely passive movements of each joint involved. As soon as the slightest active movement is possible, make them assistive in type—the patient doing all of the movement possible himself. With further recovery proceed to a few active motions so given as not to have the patient working against gravity. When possible advance to resistive movements against gravity, active opposition by the operator or apparatus to obtain this effect.

The early onset of fatigue always present in the subnormal muscles must be constantly held in mind and these exercises graded with extreme care as to type, number or repetitions and vigor of performance. In all postural defects faulty habits of sitting and standing must be corrected, the active cooperation of teacher and parent enlisted, the general nutrition built up and excessive burdens of mental or physical work or dissipation eliminated.

In closing, the point should be emphasized that all phases of physiotherapy which will aid in muscular nutrition or give sufficient contractile stimulation to prevent loss of tone, when active contraction is impossible, should be blended with the exercise régime. Only in this way can the best results be obtained in the shortest amount of time.

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Exercise in the Treatment of Hypertension*

By C. WARD CRAMPTON, M.D.,
New York.

The use of exercise in the circulatory disorders is comparatively recent. The subject attracted my attention early in 1902, when I examined several thousand high school boys in connection with their physical exercise. Many were found circulatory invalids, and their cases were studied thoroughly with the purpose of making them as fit as possible under their handicaps, to engage in active, useful lives. Subsequently, as director of the department of physical training of the New York public schools, steps were taken to introduce physical exercise into classes organized for cardiac cases. This work has been developed by the Association of Cardiac Clinics.

There is an increasing confidence in the use of exercise in circulatory disorders, based upon the increasingly successful experience in its several fields. One of the most important of these fields is hypertension.

DEFINITION.

Hypertension is a symptom rather than a disease. It is apparently due to a hypertonic state of the blood vessels, particularly those of the smaller calibre, the arterioles and probably the capillaries.

It is evidenced by any elevation of the systolic or diastolic pressure, which is not due to physiological causes. A systolic pressure of over 140 mm. recumbent, or 135 mm. standing, and a diastolic pressure of 90 mm. recumbent or 95 mm. standing, requires explanation.

ETIOLOGY.

This state is a physiological reaction of the blood vessels to vasotonic influences which are usually toxic and act directly upon the arteries or indirectly through the nerves.

These vasotonic influences are in turn caused by 1. Infections. 2. Poisons from the intestinal tract and from outside the body. 3. Strains, acute or chronic. 4. Disharmonies, either metabolic or endocrine. There is usually a combination of these causes.

Hypertension usually has two stages; first, the functional stage where the symptom exists without discoverable structural lesions, and secondly, structural, where lesions are present. The functional and structural stages of these are sometimes called, respectively, the uncomplicated stage and the complicated stage. Lesions of the kind usually associated with hypertension, to wit: hardened arteries, contracted kidneys, and the like, may exist with no hypertension, and conversely, hypertension may exist without them.

TREATMENT.

The treatment of hypertension should be directed toward: a. The patient himself as a human being who has various physical and mental processes other than the hypertension. He has a life to live and he wants to be strong, happy and as useful as possible. b. The associated diseases of the arteries, kidney and heart, and nervous system. c. The sources of the symptoms and diseases (infections, poisons, strains and disharmonies). d. The hypertension, for it in itself may do harm; but no greater mistake can be made than to treat the hypertension alone.

ERRORS.

There are several common errors to be avoided, the most important of which is the tendency to treat the symptom, hypertension, and neglect the underlying physiological process. The next most common error is to recognize and treat these etiological processes, and to neglect the patient.

The most serious errors are made by those who rely upon one line of treatment for hypertension, regardless of the sources and nature of the condition. Within the last month I have seen a patient treated for high blood pressure in a hospital for two months by rest and restricted salt and fluid, while the antrum was full of caseous material; another, with the teeth all removed, low specific gravity, high blood nitrogen with static colon was kept in bed; another with a four plus Wassermann treated only by electricity and exercise. The instances of single track therapy may be multiplied.

Proper treatment of hypertension lies in planning a program of living, rather than in writing a prescription. Exercise, diet, bathing and recreation, regulation of work, entertainment, hydrotherapy, massage, electricity, and, if necessary, drugs, should be considered. The prescription must be for twenty-four hours, for seven days of the week, twelve months, and many years, rather than for a series of drugs, enemas, and baths. This involves a radical change of method from the ordinary textbook conception of hypertension to the conservative application of the newer phases of hygienic medicine, to living rather than to disease. Physicians are too frequently merely pathologists.

DIAGNOSIS.

There should be a thorough medical search through the whole patient to discover the causes of the symptom. One must not be satisfied to find one cause. All possible causes must be found or excluded. When a cause such as nephritis is found one must go further and discover the more remote source of the causes, and beyond them still more remote influences. In addition, there must be a thorough search through the daily life and habits of the patient, including diet, rest, exercise, work, worry and sex influences.

The ordinary methods of testing the soundness of the various body systems should be used. It is especially important to test the function of the kidneys, the rapidity of passage of food through the body, the urine, and the blood. Functional tests of the circulation must complete the picture. It is not enough to listen to the heart, and take the blood pressure sitting down. The blood pressure must be taken both lying and standing. Frequently hypertension is evident only in a recumbent posture. It is evidenced by the following cases which have hypertension lying down and no hypertension standing up. (1).

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*Read before the Academy of Medicine, New York, November, 1921.

Case I.—Woman, aged fifty-three years, dementia.

	Systolic	*Diastolic*	*Pulse rate*
Horizontal	184	88	80
Vertical	100	70	82
Difference	—84	—18	— 2
Blood ptosis index			—135

Case II.—Woman, aged fifty years, diabetes.

	Systolic	*Diastolic*	*Pulse rate*
Horizontal	178	84	80
Vertical	88	50	96
Difference	—90	—26	— 16
Blood ptosis index			—165

EXERCISE.

In the past, exercise has been little used in hypertension, because of the relative unfamiliarity of physicians with its use. The ignorance of teachers of physical training of the application of exercise to circulatory diseases, coupled with the apathy and absorption of the patient, made it evident that it was safer to limit the patient's exercise than to venture into the dangerous unknown. These dangers exist.

The most evident risk lies in the increase in tension resulting from most common forms of exercise. A greater danger lies in the damage resulting from coincident fatigue or excitement. This damage is sometimes merely an excess of wear and tear which has gone beyond all power of the tissues to rebuild. Exercise is always a destructive process, though by exercise we desire to arouse a repair stimulus which effectively reconstructs the tissues, and makes them stronger.

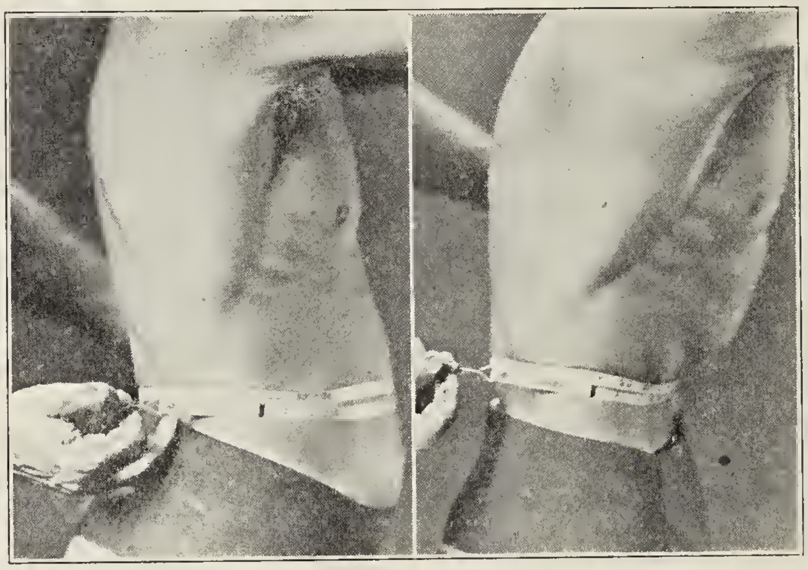
Fig. 1. Fig. 2.

Fig. 1.—Pumping, abdominal automassage by alternate contraction and relaxation of the abdominal wall.

Fig. 2.—Relaxtion.

In systems damaged by disease the repair process is itself sometimes injured, and its abilities impaired. The greatest harm that can come from exercise is a direct increase in the pathological process. This is most likely to occur because the pathological process is usually the best adjustment that a set of organs can make to counteract the damaging effects of some diseased conditions. A stimulus of any physiological process is often accompanied by a stimulation of a socalled pathological process, which is only a physiological process created to meet special diseased conditions. This is a conception of disease which is not in accord with the general textbook acceptation, which considers pathological processes as new and evil things. Muscular activity can be safely used in circulatory diseases, as a ship can sail a sea where the rocks and dangers are fully known and marked. Not only is it necessary to know the dangers of exercise, but its benefits and uses.

EFFECTS OF EXERCISE.

There are as many different exercises as there are different kinds of drugs, and their effects are almost as various. It is therefore absurd to ask the question, "What is the best exercise?" as it is to ask, "What is the best drug?" For convenience I suggest the division of the effects of exercise into the following eight classes:

			Most Typical Results
1. Local	Immediate	Mechanical	Muscular contraction — vasorelaxation
2. Local	Immediate	Chemical	Oxidation — Histamine, etc. produced
3. Local	Secondary	Mechanical	Increase in size — increased vascularity
4. Local	Secondary	Chemical	Food storage—decrease fat and waste
5. General	Immediate	Mechanical	Body massage and jar — blood pressure raised or lowered—
6. General	Immediate	Chemical	Transmutation and transfer of food waste and execretion
7. General	Secondary	Mechanical	Increased tone in all tissues—posture
8. General	Secondary	Chemical	Increased metabolism in all tissues

This table will serve as a provisional basis for the classification of the various forms of exercise, and an introduction of their therapeutic uses with particular reference to blood pressure.

VARIETIES OF EXERCISES.

There are five main varieties of exercises of value in hypertension:

1. Bed exercises. 2. Breathing exercises. 3. Anticonstipation exercises. 4. Contraptosis exercises. 5. Recreative exercises.

In addition there are others of importance including reduction of weight, psychic effect, etc.

The most prominent local, immediate mechanical effect accompanying contraction is vasodilatation. The dilatation of the vessels is calculated by Bainbridge (2) that the flow of blood through the active muscles may be from six to eight times greater than during rest.

This local effect of exercise creates therefore a larger set of chambers for the blood to occupy. If these changes occur throughout a large bulk of muscle, the additional amount of room provided for the blood can be very great. In this manner muscular exercise may be used to produce a marked lowering of blood pressure, at least twenty to thirty mm. in fifteen minutes' work. For this purpose slow, long-continued exercises of the muscles of the limbs, interrupted properly by periods of rest and relaxation, will produce best results.

Ordinarily, however, not only the local vasodilatation is elicited, but the general, pressor stimulation of splanchnic contraction and increase of heart output occur. Whether or not blood pressure rises or falls as a result of exercise depends upon whether the local vasodilatation effect on the muscles, overshadows the blood pressure raising action of the heart and splanchnics.

There are other or less important factors in operation (3). Bainbridge asserts that there is reason to believe that during exercise the products of metabolism in the muscle are not only a dilatation of the arterioles, but also of the tremendous capillary area. This is especially of interest because of the tendency of clinicians of late to believe that the constriction of the capillaries is the fundamental mechanical cause of high blood pressure.

We can make the capillaries and probably the arterioles dilate by the products of muscular metabolism; we can manufacture a natural vasodilator on the spot where it is most needed, and apply it directly. In other words, local exercise is symptomatic, endocrine therapy for hypertension (4).

This is a brief outline of the therapeutic use of local exercise of a large number of muscles, for reduction of high blood pressure. Whatever the scientific explanation may be, this type of exercise properly administered lowers blood pressure markedly for thirty to ninety minutes, and, in accordance the lowering of the pressure over a period of weeks improves the digestion, the action of the heart, and in some cases has apparently contributed greatly to a remarkable and decided recovery. A case of this type is reported as follows:

Case III.—Woman, aged sixty, complained of nervousness, pain over eyes, general disability. Blood pressure: horizontal, systolic, 210, diastolic, 110; standing, systolic, 190, diastolic, 110. Showed slight arterial hardening with no urinary findings, with the exception of a slight trace of albumin. The kidney functioned well. She was given rest in bed, a light diet and colon irrigations for four weeks, with symptomatic remedies applied, with little change in circulatory condition. Bed exercises were then undertaken. These were exercises of the large muscle masses undertaken slowly and quietly, and increased from five minutes every hour to eight minutes every half hour. A twenty-four hour prescription was written which included diet, rest, and diversion, and a gradually increasing general activity. Two abdominal exercises were soon added, the bed exercises gradually made more vigorous, and brought into longer and fewer periods, as invalidism was gradually left behind. The patient is now an active, vigorous society and club woman, with blood pressures running between 135 and 140, with a diastolic pressure between 80 and 90. The urinary picture is perfectly normal, and there is no suggestion of disease or disability, with the exception of a slight arterial thickening, and even this seems to be decreasing.

This is a common result in a typical case of hypertension approaching the structural stage. It illustrates also the general nature of the treatment.

The apparent return of hard arteries to their normal condition has been noted in four cases of a similar nature. Further report will be made. (The decrease of arterial fibrosis and the return of resiliency to the arteries will become an increasingly common experience, as our therapy improves. At present it is not only practically unknown but not expected. Eli Moschcowitz has reported in the interval between the reading and the printing of this paper a series of cases of acute nephritis following this course. The arteries, however, do not return to normal unless the patient as well as the disease is cured.)

The following prescription blank in use in one of the New York City hospitals gives an introductory series of exercises. It also illustrates the method of prescription, which includes not only the number of times, but also the rate, and emphasizes the necessary intervals of rest. This series is used not only in hypertension but also for those patients bedridden with valvular disease, myocarditis, diabetes, etc. A second series gives a more generous and vigorous set of exercises. To use the prescription the physician fills in the time for breathing, number of repetitions and rate, and makes the necessary notations in the directions at the bottom of the sheet. The conditions they indicate have proved adequate safeguards. It is necessary to have the exercises taught, but, once learned, little supervision is necessary. The best time for most cases is the first five minutes of each hour. In this and in all forms of exercise for hypertension, it is important to eliminate hurry. The movements must be leisurely. This is difficult but essential.

BED EXERCISES

Series A.

	No. of Times	Rate
1. Fist tight, open (flex, extend and separate fingers)	R. L.	
Rest Relax Breathing......Sec.		
2. Toes flex, extend and separate	R. L.	
Rest Relax Breathing......Sec.		
3. Smoothing Sheet—Wrist abduction and adduction	R. L.	
Rest Relax Breathing......Sec.		
4. Ankle Flex (emphasize) and extend	R. L.	
Rest Relax Breathing......Sec.		
5. Head Turning—Right and Left	R. L.	
Rest Relax Breathing......Sec.		
6. Hand Turnover (Pronation and supination)	R. L.	
Rest Relax Breathing......Sec.		
7. Foot Circle—Outward rotation at ankle	R. L.	
Rest Relax Breathing......Sec.		
8. Look up—Head extended backward		
Rest Relax Breathing......Sec.		
9. Hand to Shoulder—Flex and extend forearm	R. L.	
Rest Relax Breathing......Sec.		
10. Knee Raising (Flex knee and hip, foot to buttocks)	R. L.	
Rest Relax Breathing......Sec.		
	Total Time.....	

Exercises to be taken at .... A.M. every half hour, every hour. P.M., followed by rest of .... minutes.

Omit if patient is tired; if temperature exceeds 99-100.

Alternate right and left. Emphasize *complete* flexion and extension (unless painful to patient).

Exercises must be done slowly—there must be no increase in heart rate, breathing or blood pressure.

Breathing is deep, direct, i.e., chest lifted with inspiration, with no abdominal contraction.

Signs of Danger.—Sweating, palpitation, dilated nostrils, pallor, duskiness, corners of mouth drawn down.

Bed exercises are the simplest and safest of exercises for hypertension. Muscular exercise can also be performed by electrical stimulation, but this requires apparatus and tends to confirm the patient in his invalidism rather than to increase his ability. They are frequently better for the sanitarium than for the patient.

BREATHING EXERCISES.

There are four important results that may be obtained from breathing exercises: 1. To increase the mobility of the chest. 2. To increase thoracic aspiration. 3. To relieve abdominal stasis. 4. To give abdominal massage. Contrary to common report, breathing exercises are not of value in increasing the amount of oxygen in the blood.

TO INCREASE THE MOBILITY OF THE CHEST.

Hypertension most frequently occurs in those who are well along in years, and who, from lack of exercise, have never called upon the lungs for any vigorous activity. The chest wall becomes rigid. The expansion frequently is decreased to one inch or less. This rigidity is part of the general sclerosis of which the arterial hardening is but one expression.

In the normal, vigorous adult the chest acts as an auxiliary circulatory pump. It aspirates blood from the abdomen on inspiration and on expiration, throws it into the arterial system, causing a rhythmic rise and fall of blood pressures. When the chest is nearly fixed, this is diminished. Breathing exercises do good by reestablishing this rhythmic circulatory exercise. They can also do harm for they increase the arterial strain.

TO INCREASE THORACIC ASPIRATION.

When the chest loses its resiliency it usually hardens in a contracted state unless there is emphysema. It decreases in size while the abdomen usually increases, due to the constant effect of gravity upon the contents of the trunk and upon the chest walls themselves.

In a welltrained youth the chest is from six to twelve inches greater in circumference than the waist. In the halfworn adult, the reverse is most frequently the case and thoracic aspiration is reduced to a minimum. Breathing exercises of a certain kind can be used to increase the size of the chest as well as increase its mobility. This is a great advantage, in that the heart is given more room, and the circulation is unimpeded. The pressure of stomach and colonic gas gives less distress and is less dangerous in circulatory invalids. The aspiration of the thorax is increased, and the tone of the circulation is improved by the mechanical relief of the splanchnic circulatory stagnation which this affords.

RELIEF OF ABDOMINAL STASIS.

While the chest is raised and made more mobile, the aspiration of the thorax increases. This improves the upward drainage of both blood and lymph from the abdomen. The high chest relieves the abdominal contents of pressure of the organs attached to the chest and diaphragm, and decreases intraabdominal tension, and favors elimination. It thus helps the body bear the handicaps of high blood pressure and its accompanying conditions, and it helps to improve them.

ABDOMINAL MASSAGE.

Abdominal massage is one of the best results of the breathing exercise. In those forms of movement where the excursions of the diaphragm and abdominal wall are great, there is a large, marked, to and fro movement in the abdominal contents. This mechanically relieves stasis, and acts as a tonic, particularly to the intestinal tract, the liver, and the pancreas. It helps to remove the causes of intestinal autointoxication.

KINDS OF BREATHING EXERCISES.

There is a large variety of breathing exercises. There are over fifteen different useful forms. As a general rule, those exercises which give most movement to the abdominal contents and increase most effectively the thoracic aspiration are the best: One of the best breathing exercises is not breathing at all, but a see-saw movement which I call pumping, expanding and contracting the chest and abdomen alternately, but with emphasis on the thoracic expansion.

There is one important caution against the breathing exercises. In some instances they place too great a strain upon the heart and arteries. When the chest is lifted, it fills not only with air, but with blood. As it contracts, it squeezes out both air and blood. The blood must go to the heart. This sometimes causes heart strain. No breathing exercises should be given in cases of myocarditis without a careful testing of the heart. I have seen breathing exercises reestablish both auricular flutter and fibrilation during remissions of the regular heart rhythm. Breathing exercises have large and diverse values which have not been touched upon here. They will be made the subject of further report.

ANTICONSTIPATION EXERCISES.

Anticonstipation exercises fall into two classes. First, those which provide an abdominal automassage and stimulate intestinal activity, and second, those which by change of position relieve the intestines of kinks and pressures.

1. Automassage exercises.—Breathing exercises, it has been noted, provide an excellent selfmassage. In addition, abdominal bending or trunk bending forward and backward, right and left, and trunk twisting or a combination of these are useful. Exercises of this type which bring the abdomen in contact with the thighs, and particularly where the hands or fists are placed between the abdomen and the thighs to accentuate the effect, are useful. The army trench exercises and squatting exercises of all kinds belong in this category, but they raise pressures markedly. Selfmassage by the pounding of the fists of the patient or rolling a cannonball on the abdomen are useful, but are open to the same objection.

One of the most effective exercises for abdominal automassage is a circular movement of the abdomen. This exercise is best learned in the sitting position. The neck and sacrum are kept in place while the spine bends as the abdomen goes forward, left, backwards and right, describing a circle. This exercise is best illustrated by the movement of the hand in using a brace and bit, to bore a hole. While it is best learned in a sitting posture, it is most effective when done in the all fours position on the hands and knees. It will be made the subject of further report. It is used by William C. Adams, of Pompton, in the horizontal position, and called abdominal rotation, and in the sitting position in the hygienic ritual of an East Indian cult.

2. A change of posture from the vertical head up position to the trunk horizontal or the head down position works great changes in the intestinal condition. Very frequently we see an x ray picture of the transverse colon isolated by a kink at either end, under the liver and at the spleen. Small kinks occur in the sigmoid flexure. Placing the patient on all fours may straighten these out. Exercises such as rotation in this position will stimulate intestinal activity. There is a large variety of useful exercises of this type.

These two varieties of anticonstipation exercises are frequently exceedingly effective. The abdominal rotation and churning does not raise blood pressure materially nor do the simple exercises in the all fours position. The intoxication which is the basis of the high blood pressure is caused by intestinal position, and frequently a great improvement results. It is not uncommon for this combination of exercises to effect a cure in constipation that has resisted treatment for ten to fifteen years.

CONTRAPTOSIS EXERCISES.

Structural, visceral and blood ptosis are commonly found together in high blood pressure cases, due to the fact that inactivity, the most frequent contributing cause of high blood pressure, also causes weakness which permits gravity to pull down structures, organs and tissues of all kinds. The chest is small, the abdomen bulging, head hanging and the blood pressure is frequently from thirty to eighty mm. higher lying down than it is standing. (7).

Breathing exercises as indicated would help to reestablish proper tone. Exercise of the muscles of the back of the neck raise the head, and others strengthen and shorten the muscles of the abdominal wall and assist in raising the chest.

RECREATIVE EXERCISES.

The patient with hypertension should engage in the motor activities appropriate to his age, station in life, etc. Arteriosclerosis is an indoor disease. There should be a definite prescription of walking, golf, gymnasium activities, dancing, fishing; but in some cases the more vigorous exercises such as tennis and handball should not only be permitted, but encouraged. It is important that the patient should be given exercises which he likes or can learn to enjoy. Exercise that is not done has no therapeutic value. Companionship is of great assistance. Vigorous exercise frequently makes some patients much happier, and this contributes greatly to their welfare.

The patient should be put upon a twenty-four hour prescription, giving the proper adjustment of rest, exercise, meals and work. This will involve at first a careful analysis of the patient's history, interests and social conditions, as well as his physical and medical state. As soon as these conditions are ascertained, and the patient trained to do as he should, and he understands the reasons for this routine, he should be released from immediate supervision, otherwise he may be trained into the unhappy state of expert invalidism, a condition in which everything is seen in its bearing upon personal health.

PROPHYLAXIS.

Exercise has a large rôle in the prevention of conditions associated with high blood pressure. A good exercise program should include as follows: 1. Daily morning exercise with special attention to abdominal wall—twelve minutes. 2. Daily walk—three quarters of an hour to one hour (standard rate 120 steps to the minute—thirty inches to the step). 3. Three times in a week an hour of vigorous exercise preferably of the recreative character. 4. Once a week half a day to a full day should be spent in the open air.

In hypertension, depending upon the character and quantity of the exercise taken, and the associated pathological conditions, there may be expected a decrease in the diastolic pressure followed by the systolic, an improvement in muscular tone, circulation, nutrition, and psychological condition. There can be a great improvement in posture, and there is possibly reason to believe that the condition of the arteries and heart can be materially improved.

SUMMARY.

It should be recognized that various forms of exercise have different purposes and results. It is necessary to use this therapeutic procedure with just as much discrimination as one would use in prescribing drugs.

Exercise is a vasodilator and a reconstructive tonic. It is not a panacea. It should not be a fad. It will not replace the diet restrictions of salt, water or proteid, nor will it displace rest, salvarsan, or any other appropriate therapy. It has a place in the therapeutic program and its omission should be considered the exception and not the rule.

The author's references will appear in his reprints.

A Practical Method to Determine the Correct X Ray Dose in High Voltage Treatment*

By HANS HOLFELDER, M.D.,
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The chapter of modern, deep röntgen therapy has reached such dimensions that it will be impossible for me to touch upon more than the main points of the subject, omitting all discussion of the many details, so important in themeselves.

As is well known, the penetrating x ray treatment was first employed in a systematic way by the gynecologists of Germany. Their experiences with the method date back some five to six years, and have actually proved that x ray treatment in the hands of a skilled operator accomplishes as much, if not considerably more, than the bloody operation, in the treatment of tumors of the uterus.

The reason that gynecologists have been so much more successful with the deep x ray treatment than the general surgeon, is referable to two factors. In the first place, they are always dealing with one and the same organ; and secondly, this organ is most favorably situated within the centre of the pelvis, and is also accessible to direct examination. This fact greatly simplified and unified the physical problem. For so long as one succeeds in concentrating a symmetrical crossfire from various x ray cones upon the uterus in such a way that the centre of the organ receives the desired dose, one can be fairly certain of the equal distribution of the desired dose over the entire cancerous area. The problem in a way resembles the art of artilleristic sharpshooting.

For the surgeon, however, conditions are far more difficult and complicated. Aside from the differences involved in the biological problems the physical problem is also much more intricate. The tumors the surgeon is called upon to treat are often very extensive, they are seldom located centrally, in fact, generally excentrically, and different in every case. Frequently there are neighboring organs that are sensitive to the x rays and hence have to be protected against large doses. A permanent result can be expected only, however, if we are able to apply uniformly the x rays to every single point of the extensively ramified tumor region, so that no point receives either too much or too little. In artilleristic language, the problem of sharpshooting has thus become transformed into the difficult problem of freehand shooting.

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*From the Surgical Clinic of the University of Frankfort on the Main. Read before the Clinical Society of the Lenox Hill Hospital, New York, November 11, 1921.

In view of the great diversity of conditions in every case, it is impossible to standardize the problem. Each case presents special topographical relations that have to be considered, and requires the formation of a separate plan. In order to do justice to these requirements, it is necessary that we free ourselves from long and cumbersome mathematical calculations. We have to find the ways and means that enable us to act in accordance with the needs of the individual case.

I am in a position to present, in brief outline, a method that has been evolved at the Surgical Clinic of the University of Frankfort on the Main under the direction of Professor Schmieden, the merits of which have been practically demonstrated within the past two and three quarter years.

The method enables the röntgenologist to obtain, within a few minutes, a plastic picture of the distribution of the doses within the body, and thus to form a plan that seems best suited to the case in hand. The description of *Felderwähler,* that is, field selector, was presented in October, 1921, and was published in extenso, with illustrations, in the *American Journal of Röntgenology.*

I should like to add a few words regarding the practical results obtained with this method. The period of observation is, of course, entirely too short to speak of permanent results and the early results so far obtained are by no means uniformly favorable. We still have a certain number of cases which we are unable to benefit. But we also have another series in which the results have been actually amazing, showing beyond a doubt the great superiority of this procedure over the old, inexact x ray methods, and we, therefore, feel that we can conscientiously recommend the method for general trial.

Particularly striking have been the results that we have observed in the otherwise absolutely hopeless cases of bone and liver metastases. We have seen spontaneous fractures healed within a remarkably short time. We have on record several cases of definitely proved liver metastases, secondary to carcinoma of the rectum, that have completely healed, clinically. We have one case of liver metastasis, fully the size of a man's head, following melanosarcoma, in which the patient became entirely well and was able to work, two and three quarter years after treatment—a result which, to my knowledge, has never been achieved with any of the older methods in this most malignant type of tumors. It seems that our exact technic is capable of producing better results in cases of metastases than in primary tumors. In the latter, the technic of radium emanations, as worked out in America, seems to attain better results. I have seen primary tumors so markedly influenced by emanation implantation at the State Cancer Institute in Buffalo, that it is my firm conviction a combination of our x ray technic and the American emanation implantation will become the method of the future.

Now, as to the question of drawing the dividing line between the surgical operation and x ray treatment: I wish to emphasize that at the Schmieden Clinic we do not consider it justifiable to subject to the x rays —a method still in the evolutionary stage—a truly operable carcinoma, but invariably resort to the surgical operation as the method that has been fully perfected and tested. However, we believe x ray treatment in conjunction with the surgical operation to be of great value.

When it comes to operable sarcomata, however, our position is different. Seitz and Wintz found thirty-three per cent. of the patients reported cured by the x rays to have remained well for three years, and a preliminary survey of our own cases promises results at least as favorable. It appears, therefore, that the patient's chances of a cure by x ray treatment are fully as good as those treated by the surgical operation, while he escapes all mutilation. In view of these facts, we have ceased, at the Schmieden Clinic, to attack sarcoma of the extremities with the knife, but apply the röntgen rays instead.

The foregoing will give a fair idea of the rules followed at the Schmieden Clinic as regards the technic in the application of the röntgen rays. Since the method has not been tested sufficiently long, it may be well to limit somewhat the indication for its use at this early stage.

As the most important advantage of our method we consider the fact that it enables the trained röntgenologist to form an exact plan of treatment, adaptable to the particular topographical conditions present in the given case. The determination of the doses in deep x ray work has thereby been greatly facilitated.

Permit me, in closing, to make a few personal remarks:

After a three months' sojourn, I am about to leave this wonderful country, to return to my work in Frankfort on the Main. Owing to regrettable external circumstances there has been an interruption of scientific intercourse between our two countries for six years. Through your extraordinary hospitality I have been given an opportunity, as one of the first from abroad, to become acquainted with the progress of American science within this period. As different as the external conditions have been under which the evolution of the sciences of both countries have had to progress, so also has been the direction in which the advances have been made. The scientific joy which I have experienced in the study of the interesting progress made in America, is difficult to describe. If I have succeeded by the demonstration of what we have been doing abroad in arousing, in turn, within you if only a slight degree of that scientific joy, I shall be very happy indeed.

Let me thank you most sincerely for the splendid hospitality that has been extended to me while in your country; and let me add the statement that whosoever may come to Europe within the next years, in order to inform himself on the work that has been done there, he may be assured of a most hearty welcome at the university and especially as the guest of the Schmieden Clinic.

The Use of Static Electricity in the Treatment of Noninfected Inflammation

By WILLIAM BENHAM SNOW, M.D.,
New York.

The time is not long since, when the static electric methods were tabooed and rated, by some, as tolerable methods for effecting psychic influence upon emotional individuals. The theorists labored under that impression, and the notion that it exerted no material influence upon underlying internal structures. Until the works of Humphris and Turrell were published foreign authorities had contributed little to the recent literature of the static modalities. The Germans and Austrians have never contributed anything of note on the use of the static methods. The French authorities admit the neglect of the static methods, and the French machines are inadequate for producing the necessary effects to carry out the treatments to be here described.

To the American investigators must be accorded the credit of developing this, now well established, department of electrotherapeutics. Morton's currents and his lucid exposition and persistent effort at development of means and methods laid foundations upon which the science and modern methods have been established by himself and his students.

With those who are familiar with all electrotherapeutic methods the use of the static methods fills an indispensable place in medical practice, accomplishing what no other physical or other method can replace or supply.

In the scope of this paper it is only possible to outline the characteristic effects and give a general consideration of the ways in which the electrostatic methods are made to influence and restore normal processes.

First of all, and throughout the consideration of the subject, the static methods must be recognized and treated as mechanical measures, producing no electrolytic effects as are produced by the galvanic current—the directional or constant current of larger amperage. The static current flowing with opposite polarity from the two poles of the static machine is a direct or constant current of very high voltage, but of infinitely small amperage; the current strength varying from one tenth of a milliampere in the smaller machines to a maximum of seven milliamperes from the most powerful high speed static machines that have been built.

Currents having these qualities possess properties that are distinctive, and the static current in particular, from the manner of generation has other unique qualities, in which it differs from all electrical currents from other sources, which renders it impossible to duplicate the same results from other apparatus.

Its effects upon animal tissue is unique in that it individualizes the tissue cells regardless of the nervous mechanism, causing the muscle cells to contract independently of the nerves, as does the constant—the galvanic—current of low voltage. The galvanic current when applied with interruptions will cause detached muscle cells to contract (1). While the galvanic current, of low voltage, must be applied directly to the muscle mass and interrupted to produce such contraction, the static current of great voltage and small amperage will induce the same effect upon the tissues beneath the integument and layers of fat and without injury to the most delicate structures. Herein lies the advantage of the static modalities, effecting, as they do, contraction of the collections of cells that constitute the muscle mass independent of the neuromuscular mechanism.

When contraction is induced in this manner in swollen infiltrated tissues the effect is to relax the tension of the muscles and force out or express the exudations from the lymph spaces, on through the lymph channels, and thus remove the accumulations of waste matter from the tissues. This is readily demonstrated by the depletion with softening and removal of the swelling from the tissues which follows the scientific use of the static modalities or methods of administration.

The effort to attempt to remove foreign exudates by inducing contraction by stimulation of the neuromuscular mechanism at motor points with other electric currents are futile, as is readily demonstrated by the contrast of clinical results from the employment of other methods as compared with the strikingly successful depletion by the direct stimulation of engorged tissues with the static methods.

Based upon this principle the static current fills an invaluable place in the treatment of noninfected inflammation and in activating dormant conditions, which it is impossible to accomplish in other ways.

The generally accepted notion, that inflammation is a tissue reaction following trauma, or any severe local irritation, seems on the contrary, from the facts observed, rather to be a condition in which the influx of blood is so excessive that stasis is established with complete inertia from too great an influx of blood induced in the tissues involved—the result of an unnatural cause. The call for repair of damage done results in a profound tissue engorgement with the normal processes *hors de combat*. Such is not reaction, but inertia—with the presence of pain due to pressure—a condition which tends to persist indefinitely and results, if not relieved, in the varying degrees of hyperplasia which will result in what is designated chronic inflammation, or, without a correct recognition of the original cause, is very often dignified by the erroneous term—chronic rheumatism.

There is a great and extensive field of indication for the administration of the static methods which will promptly displace the exudations, the local stasis —a large and important field which is indicated for the relief of all inflammatory conditions in which infection is not present, and would so be scattered, or in cases of fracture when the muscular actions induced would displace the parts. No other known methods succeed so well if at all in the conditions mentioned.

When massage or manipulation is applied to acutely inflamed conditions it increases the inflammation; whereas, the static modalities relieve it by removing the exudation, and there is no comparison in the benefits derived. Massage works and irritates a part, while the static modalities make the parts work, and so relieve the swelling and tension, without irritating the sensitive tissues.

The treatment of a sprained ankle, a condition which is completely relieved, and uniformly within five days, oftener in three days if it comes under observation the day or day following the accident, will well illustrate the *modus operandi,* and general result of static administrations.

Case I.—Mr. T. sustained a severe sprain of an ankle joint at his home in New Jersey, injuring it so severely that he came to town on crutches and to our office in a taxicab. The ankle over and around the internal malleolus was much swollen, and any movement of the joint was very painful. Metal electrodes were applied to the swollen parts, and the static wave current administered with a regulated spark gap for twenty minutes. The static brush discharge was then applied over the more sensitive and ecchymotic areas, where blood had escaped beneath the skin from rupture of the small vessels in the injured parts. The application was continued until considerable infiltration was removed as evidenced by the relief from pain and softening of the tissues. The patient could then move the joint with little pain, but there was still marked stiffness and a sense of heaviness due to tension of the muscles of the leg and foot that crossed the joint, and considerable infiltration in the deeper tissues around the malleolus. Indirect static sparks about one inch in length were then applied to the deeper parts and to the extensor and flexor muscles of the leg from the knee to the ankle joint, and of the foot until the tension of the muscles was entirely relieved and the ankle could be moved without tension or pain.

The effect of the static sparks and static wave current in removing or relaxing muscular spasm present with all inflammatory conditions is remarkable and beneficent, for otherwise as in all cases of traumatic arthritis the relief would be but partial; whereas, as in this instance, the relief was complete. The treatment had consumed about one hour of an operator's time, but the relief afforded was the reward, the patient returning to his office by public conveyance, with his crutches in his hand, and without pain or disability.

Applications of the brush discharge on the two following days, to complete the absorption of the ecchymosis and sparks, as on the first occasion, and the cure was complete.

The details have been given at length in this case as illustrative of a complete technic in the treatment of traumatic arthritis. This technic with some slight modifications is applicable to the treatment of arthritis in every joint of the body. As a rule, however, except in the treatment of the ankle and small joints of the hands, the static brush discharge is not required.

Many sprained ankles have been cured by me during the past twenty-five years in an average time of three days. In but two cases has there been any rupture or fracture of the other joint structures. In these, with torn ligaments, a removable plaster cast was adjusted to the limb and foot and frequently removed for static treatment, a complete cure being effected in six weeks, during which time the patients wore the plaster splints and were otherwise unrestrained. One, a chauffeur, after the first week resumed his work without discomfort or seeming impediment to his complete recovery.

Case II.—Mrs. G., another case of sprained ankle, illustrates the surgeon's method and the general attitude as to the prognosis in these cases. Mrs. G. sustained a severe sprain of her left ankle and consulted a distinguished young surgeon, who had served in the Great War. He told her that she had ruptured a ligament and that it would be many weeks before she could play tennis. He strapped the ankle in the usual way of the surgeons. At that time she told him that she thought she knew where she could get more prompt relief. She came four days after the accident and was completely relieved after six days. The result demonstrated that there was no injury to the ligaments other than strain.

Case III.—Mr. M. P. The following case will illustrate the results in the treatment of traumatic injury of the knee joint: The patient while playing golf accidently dislocated his knee joint and was referred to us for treatment. He came in a disabled condition with pain and swelling of the joint and tension of the muscles of the leg and thigh. The wave current was first applied to the joint, after which long sparks were administered to the openings around the joint and up and down the muscles of the leg and thigh, avoiding the bony prominences, until the pain was relieved and the patient stepped from the platform, and said that it was a miracle. It was not, but the usual relief that we are able to give in these cases was afforded the patient. One additional treatment on the following day and the relief was complete.

Case IV.—Captain K., M. C., while riding a horse at Camp Merritt, was thrown from his horse falling upon his right shoulder. He sustained a severe contusion of the shoulder without fracture. At that time he had been investigating physical therapeutic methods and came in with his arm bandaged to his side in a helpless and extremely painful condition. The static wave current was applied over the shoulder where the injury had taken place followed by the static sparks over all of the tense muscles in the region. Following the first treatment he was able to move his arm and wear his coat when he returned to camp. He received but three subsequent treatments when the parts were normal. This removed from his mind every element of skepticism concerning the therapeutic advantages of the static modalities.

In cases of arthritis that have been neglected for two or three weeks, it takes much longer to relieve the condition. Uniform success, however, attends the static treatment when only a sprain or strain is the occasion of the trouble.

The following cases will illustrate the results obtained in the cases of sacroiliac subluxations—one of the most common accidents that occur—so common that within a year upwards of fifty cases have been treated in our office, and with success.

Case V.—Mr. G. dislocated his right sacroiliac articulation while playing polo. He came into the office so disabled that he required assistance to get up and down steps and on the insulated static platform. The referred pain along the course of the sciatic nerve and down the crural nerve was severe, due to the irritation of the branches of the lumbar plexus that make up these great nerve trunks, where they cross the sacroiliac synchondrosis. In fact most of the patients who apply for treatment complain of sciatica or call it lumbago, and come for treatment of those conditions.

The static wave current was applied over the gluteal muscles and across the back with two twenty minute administrations, employing an electrode of soft metal four by ten inches first across and over the quadratus lumborum and psoas muscles and then over the synchondrosis and glutei extending below and including the sacrosciatic notch where the sciatic nerve emerges to relieve the local infiltration over the synchondrosis and the tension of these muscles, which hold the bones fixed in displacement. The application over the latter parts is attended with severe pain if the spark gap is not regulated to toleration. Having relieved the tension the next step is to restore the displaced bones of the joint to their normal position. This can either be done by extension or manipulation. When the displacement of the ilium is downward—the most common displacement —place the patient on an operating table with his back to the operator, lying on the side not involved, with his legs slightly flexed. The operator then exerts pressure with one hand upon the ilium, after relaxing the muscles by firm pressure; pressing the ilium downward makes a sudden impulse downward. At the same time with the other hand the shoulder rotates in the opposite direction. By thus using both hands one resting over the crest of the ilium and the other rotating the body backwards, it is as a rule possible with cases treated early to reduce the displaced bone with the first effort. In cases in which the displacement is downward, as most of these cases are, the next move that is employed is to flex the leg and thigh and force the thigh well up on the trunk, and then turn the knee outward, rotating it downward gradually and extend; employing practically the same method as in replacing a dislocation of the hip joint. Then flex the knee and thigh upwards with the hands on the leg and give it one or two sharp jerks, extending the thigh and leg down. In recent cases this last maneuvre will often suffice to replace the displaced joint.

When the static wave current has been applied first to relieve the muscular spasm the reduction in severe and neglected cases is rendered possible—the muscular contraction of the powerful thigh muscles otherwise offering too great resistance. After the manipulation for reduction, it is customary to apply long static sparks to the involved muscles to insure against recurrence of contraction, which may, and often does, throw the part back in displacement when the static current is not employed.

The patients are instructed to exercise three times daily, lying upon a hard surface and raising the body in the opisthotonos position with the shoulders and heels resting on the floor, performing this exercise as first suggested by Dr. Frank E. Peckham, a few times after each interval to maintain the muscles in a relaxed condition.

Mr. G., following the replacement, with the daily static treatment and exercises, as outlined, made a steady improvement and complete recovery and within twelve days was able to play polo.

Case VI.—Mrs. M., another case, will illustrate the results in a chronic case of sacroiliac luxation. She had been suffering from pains in the lower back and thighs for several months. For relief she had consulted many physicians in the South and had been referred to New York. In the opinion of the physicians who examined her at Bellevue Hospital the suffering had been considered as due to trouble in her kidneys and bladder and she was referred to Dr. Edward L. Keyes, Jr., who referred her to me as a case of arthritis involving the lower back region. A sacroiliac luxation was readily diagnosed from the tenderness over the synchondrosis, and her inability to raise the right leg on the affected side while lying upon the back. Great tenderness was evinced when the static wave current was applied over that articulation, as in the previous case. Pain at this point when thus caused is characteristic of a sacroiliac luxation. This patient was treated by the method described in the treatment of the previous case and made a prompt improvement, and though she had been suffering from the condition for many months was cured within six weeks, and returned to her home in the South.

Case VII.—Mr. M., a laborer, was loading empty ten gallon oxygen tanks on a truck. Grasping one unsuspectedly filled with water he induced a luxation of the joint. He was brought to our offices in an all but helpless condition by a man who was with him, and the diagnosis was readily made of a sacroiliac displacement. The man was given the static treatment over the region of the ilium, and long static sparks, as described, and an effort was made at reduction by extension of the leg, but at first without success. He was able, however, after the treatment, to go to his home, ten miles away, by public conveyance and returned to the office in five hours; indicating the marked relief obtained from the static treatment, even with the displacement not completely reduced. The displacement was reduced the same day, when he returned, and on the following days two additional treatments restored the parts to normal. Prompt relief is thus obtained in all cases that come under observation immediately following the accident.

That the static wave current plays the most important rôle in the treatment of sacroiliac subluxations has been shown in my experience from the fact that for ten years cases of sacroiliac luxations had been relieved and successfully cured by the static wave current and sparks without the methods of adjustments, as outlined, except by Dr. Peckham's method of exercising the body in the opisthotonos position while resting upon the heels and shoulders as previously described. The following cases will illustrate the method and results:

Case VIII.—Dr. McK. came to my office with a painful condition in the leg and thigh caused by a sacroiliac luxation, which was readily diagnosed by placing the patient upon his back on a table, when he gave the characteristic indication of Goldthwaite, being unable to raise the heel on the affected side from the table. In this instance the pain was so severe that he could barely instigate a movement. The static wave current was applied to the affected side and caused the characteristic pain over the part. It was followed by the application of long static sparks over all of the local muscles. He left the office in a fairly comfortable condition and returned the following day reporting little discomfort in the interval. The same routine was carried out as on the previous day and the Peckham exercises were begun. He came again on the third day and showed marked improvement. He left the office with no discomfort and with an appointment to come again in two days. He did not keep his appointment, but ten days later called me on the telephone and told me that he had been busy and had had no pain since the last treatment and did not think that more treatment was necessary, as he was cured.

There is no class of cases in which the static wave current plays a more important and useful part than in the treatment of sacroiliac luxation.

Neuritis is another painful inflammatory condition in which the static modalities are the preferred methods. The referred pains of neuritis often mislead physicians and they are likely to apply lotions and liniments over the painful spots without reference to a local lesion. Whereas, in cases of brachial neuritis if a metal electrode is placed over the shoulder, a place of severe tenderness will be located somewhere over the branches of the plexus, which will locate the lesion. An application of the static wave current will elicit much pain over the region so located and the patient will endure but a very short spark gap, the dose given being measured by the length of the spark gap in the treatment of all painful conditions. When these patients are treated at the onset, only a very few treatments with the wave current and sparks will be required to effect a cure. If the case is of toxic origin, however, as we find about ten per cent. of cases to be, a longer time will be required to remove the condition, when added strict attention must be given to removal of local sources of focal infection. If a case of neuritis or any other inflammatory condition that is allowed to persist for two or three weeks before treatment is instituted, whatever the cause, it will take considerable time to effect a cure on account of the adhesions and hyperplasia that will have taken place. If the patient will agree to persist in neglected cases, however, a good prognosis can, as a rule, be given.

The following case report will illustrate the characteristics of both the neglected cases, and those receiving prompt attention.

Case IX.—Mr. H. came suffering from a chronic neuritis of several months' standing and at first the improvement was marked to a certain state of improvement, after which persistence for three months was required before the trouble was finally conquered by the static treatment. The same patient called on the telephone ten years later to say that he had a severe case of neuritis, and could not dress himself without assistance. He was able to get to the office, however, and was completely relieved by the first treatment of the pain, which had prevented sleep the previous night and the disability was relieved. Two more treatments with the regular routine method with the wave current and sparks as described effected a complete relief and cure of the condition.

Sciatic neuritis, tic douloureux, herpes zoster and numerous other cases of localized neuritis are successfully treated on the same general principle.

The whole list of inflamed conditions in which the electrostatic modalities perform effective services have demonstrated the effectiveness of these important measures.

Wherever infiltration exists in the body, as in hypertrophic cirrhosis of the liver, malarial enlargement of the spleen or disturbed metabolism of the pancreas, as of the uterus or prostate gland; in all conditions, not characterized by the presence locally of infection or malignancy, the results obtained by the use of the static modalities have an established place in the therapeutics of all such conditions, as also in spasmodic conditions occurring with noninfected inflammation in all parts of the body in which they afford relief that cannot be obtained so well from other sources.

The static modalities play a rôle as compared with massage which replaces it in the treatment of contracted muscles. This is due to the fact that the static current causes the muscles to work and so removes the tension, whereas massage works the parts. Both from the point of view of depleting and removing the tension and improving the nutrition the static methods are superior to massage, except in cases of bone fracture for the relief of which reflected incandescent light and heat is better than either.

CONCLUSIONS.

1. The static current is a direct or constant current of small amperage and high voltage, and produces practically no electrolysis. The effect of the current is essentially mechanical.
2. The static modalities affect the muscle cells beneath the skin and layers of fat inducing independent contraction as the constant current of low voltage does when applied directly to live or dead muscle tissues.
3. The distinctive property of the static modalities, from the character of the action upon the muscular and elastic tissue structures, a, cause drainage or expression of exudations as present in conditions of stasis in the lymph spaces through the lymph channels, thus restoring circulation and repair, and, b, relieve muscular spasm when present, and are indicated in all cases except when infection is present.
4. The essential property of the static current is such that it is indicated for the relief of all cases of noninfected inflammation and for the improvement of general metabolism.

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885 West End Avenue.

X Ray Therapy in Exophthalmic Goitre

By SINCLAIR TOUSEY, A.M., M.D.,
New York.

FREQUENCY OF THE DISEASE.

Cases of exophthalmic goitre are very numerous, as evidenced by the fact that a surgeon in another city performs surgical operations on perhaps eleven cases in a single day, and also by the fact that I have half a dozen cases under treatment at the present time in my private practice. But there are numerous persons with or without noticeable goitre whose lives are marred by the effect of disturbed thyroid secretion. A man of good intelligence lacking only in initiative or "pep" may acquire that mysterious quality and achieve professional or business success following the discovery and remedy of thyroid disease. And many a woman with a pulse of 90 to 120 and a general condition of invalidism becomes well and strong. The cases which are most certain to be recognized and referred for appropriate treatment are those which present the typical symptoms of Graves's disease: exophthalmos, which may be slight; pulse of about 120; palpitation of the heart; tremor so pronounced that it is difficult to pour out a cup of tea without spilling it; debility, varying from nervous prostration to severe toxic symptoms; and thyroid enlargement, which may be slight.

CAUSATION.

There are many cases in which a nervous element seems to be responsible, as when several young women at the same school manifest it at the same time. Many cases follow the birth of the first child. Other cases seem to be dependent upon the quality of the water or food; for example, a deficiency of iodine. The prevalence of goitre in Switzerland has always been attributed to snow water. I always make radiographs of the teeth and in some cases very marked periapical infection is found. In one of the cases now under treatment three unerupted and impacted wisdom teeth have pressed against the roots of the second molars and caused them to grow in a bent shape. No attacks of pain occurred but I am sure there was nerve strain and this may have had a causative relation to the exophthalmic goitre. And in this particular case there was mental disturbance which made the cure of both dental and thyroid lesions imperative. Syphilis is one of the causes and these cases require the local treatment for exophthalmic goitre as well as the constitutional remedy.

DISTURBED THYROID FUNCTION.

Disturbance of thyroid function naturally divides itself into hyperthyroidism and hypothyroidism; or into excessive and insufficient thyroid activity. Cases of exophthalmic goitre, meaning rapid pulse, some thyroid enlargement and protrusion of the eyeballs, may have either hyperthyroidism or hypothyroidism and some cases begin as one of these disturbances and change to the opposite. In excessively fat persons, insufficient thyroid secretion is often present without exophthalmic goitre. And of course an absolute lack of thyroid secretion or complete extirpation of the thyroid gland is incompatible with a state of health, myxedema being one of the consequences. Cases of exophthalmic goitre with hyperthyroidism might be expected to be distinguishable from those with hypothyroidism by such symptoms as greater intestinal activity, normal perspiration and clear complexion in hyperthyroidism, contrasted with sluggish digestion, muddy looking skin, and absence of perspiration in hypothyroidism. But as a matter of fact such symptoms do not always enable one to decide the question, and as the required x ray applications are different it is quite necessary to test the matter.

TESTING FOR HYPERTHYROIDISM OR HYPOTHYROIDISM.

This is accomplished by me in various ways. Administering iodine aggravates the symptoms if the case is one of hyperthyroidism and so does the administration of thyroid extract. The test need last only a day, the results being prompt and transitory, with no bad aftereffects. The pulse which was about 84 may go beyond 100 during a single day's administration and return to 84 the next day, when the iodine or thyroid extract is stopped. If there is no aggravation of the symptoms a considerably longer test with iodine or thyroid extract may prove that its effect is beneficial, and it may be used as an adjunct to the regular course of treatment in a case which this test indicates to be one of hypothyroidism.

Another test is the administration of pituitary gland. This has a specific effect, relieving the symptoms of hyperthyroidism almost as promptly as iodine or thyroid extract aggravates them. I have observed little or no immediate effect upon cases of hypothyroidism.

In a case which was thought on general principles to be probably one of hyperthyroidism, if the pulse was in the eighties or nineties and I was going to use a medicinal or endocrine test, it would probably be thyroid extract, at least at the start, and in case of an aggravation of the symptoms a subsequent test would be made with pituitary. If, on the other hand, the pulse was 110, 120, or more, and this kind of a test was to be made, it would doubtless be with the pituitary, because of the probable hyperthyroid nature of the case and the greater desirability of a favorable rather than of an unfavorable reaction.

My favorite test is the measurement of the basal metabolism. An increased metabolic rate is present in hyperthyroidism. It requires preparation by fasting for twelve or fifteen hours and the apparatus and technic are elaborate, but the test itself causes the patient no inconveniences or discomfort and there is no aggravation of symptoms whatever the nature of the case may prove to be. It is employed whenever practicable, except when a short cut toward the selection of a medicinal or endocrine adjuvant to the x ray and electric treatment is desired.

THE THYMUS GLAND.

This gland often seems to be concerned in exophthalmic goitre; and in cases of hypothyroidism it is my custom to apply the x ray to the thymus as well as to the thyroid.

SIMPLE TUMOR OF THE THYROID GLAND.

This is a different disease from exophthalmic goitre. Some of these tumors yield to x ray or radium treatment and some are very resistant. In the latter cases I employ radiation as a first aid and advise operation as a last resort. This is in marked contrast with my feeling regarding exophthalmic goitre, for which I consider radiation and medicine or endocrine therapy as usually the complete treatment, and I have often been called upon to employ these measures after the failure or incomplete success of surgery.

CASES IN WHICH SURGICAL OPERATIONS HAVE BEEN PERFORMED.

There may have been a ligation of the inferior thyroid arteries or a removal of some part of the thyroid gland; or in some of my cases both of these operations have been performed before the case was referred to me. The continuance of the rapid pulse, exophthalmos, slight enlargement of the remaining part of the thyroid gland, and a condition of invalidism has called for x ray, electrical and endocrine therapy, and even in these cases the patients may be restored to health and strength.

PRINCIPLES OF X RAY THERAPY IN THYROID DISEASE.

It is especially desirable that the skin shall not be affected because of the number of applications and the time over which the series of treatments sometimes extend. Any effect upon the skin might have a permanent aftereffect. To secure an effect upon the thyroid gland without an undesirable effect upon the skin, the x ray should be of considerable penetration. It should correspond to a long spark and be filtered so that practically no rays are applied which would be entirely arrested by the skin without beneficial effect upon the thyroid. The exact wave length of the x rays or the equivalent spark length is unimportant. All x rays that reach the thyroid have a specific effect upon it and I have cured cases with rays varying from a four to a twelve inch spark. I have never sought to obtain a cure by a single massive dose of x ray or radium, as is so often done with fibroid or malignant tumors in other regions.

The effect sought in cases of hyperthyroidism is to cause a fibrosis of part of the excessively active and more or less overdeveloped glandular lymphoid tissue. This is similar to the result of x ray applications to a tuberculous lymphatic gland. There is usually a reduction and very often a marked reduction in the enlargement but the special object sought is not to secure absolute disappearance of palpable or visible evidence of the thyroid gland. The desirability of leaving the requisite amount of properly functioning thyroid gland is an important reason for accomplishing a cure gradually and not by a single dose which might possibly be overestimated. Three applications a week result in progressive reduction in the pulse rate and improvement in appearance and all other symptoms. It is my custom, in a six weeks' course of treatment, to apply the dose of x ray which I know will not affect the skin and then to have an intermission during which the x ray is not applied but other forms of electricity, with or without endocrine therapy, may be given. At the end of six, eight, or ten weeks the x ray treatment is sometimes duplicated, or in some cases the subsequent applications are made one, two or three weeks apart. The electrical treatment usually employed as an adjunct is the rhythmic static wave current applied to the thyroid for fifteen minutes and to the epigastrium for twenty minutes. The dose of the x ray must be left to the judgment and experience of each operator and if I mention my own it is not as a prescription to be implicity followed by others. My patients are at present receiving six minute applications over a four by five inch area, at a distance of sixteen inches from the anticathode through six millimetres of wood in contact with the skin, and half a millimetre of zinc and two fifths of a millimetre of aluminum near the x ray tube. The current traversing the tube is two ma. and the equivalent spark is eleven and a half inches, equal to a voltage of 170,000. A total of one hundred minutes is applied in six weeks.

Cases of thyroid hypertrophy, in which there is a normal pulse, no noticeable tremor, but with Graefe's sign, the upper eyelid not following the movement of the eyeball downward, and with every probability of the development of the other symptoms of Graves's disease or exophthalmic goitre, should receive the treatment outlined above.

THE TREATMENT OF HYPOTHYROIDISM.

The extreme cases of myxedema require thyroid extract at first. But even from the first, stimulating doses of the x ray are applied to the thyroid and to the thymus; and the static wave current is applied to the thyroid and diathermy to the liver, kidney and adrenal glands. From a suitable high frequency apparatus one terminal is connected with a metal sheet electrode five inches square, or larger, in contact with the skin over the front of the liver, while the other similar electrode is over the region of the right kidney. A current of 1,100 or 1,500 ma. is applied for thirty minutes or less. This would reduce the blood pressure in cases of high arterial tension, but it usually does not reduce it in cases of low arterial tension. The diathermy promotes natural liver and intestinal function and very often these patients get rid of the habit of requiring a laxative. The stimulating dose of x ray applied by the author has the same factors as already detailed, except that a total of only about twelve minutes a month is applied to the thyroid and sixteen to twenty-four minutes a month to the thymus. In the ordinary case of hypothyroidism there are noticeable enlargement of the thyroid, anemia, and general debility, with or without rapid pulse.

ENDOCRINE THERAPY AS AN ADJUNCT TO X RAY AND ELECTRICAL TREATMENT.

The whole gland pituitary is used in the diagnosis and treatment of hyperthyroidism and thyroid extract is similarly employed in hypothyroidism. It should be noted that all my earlier patients were treated with the x ray alone, including one of the two detailed herewith who have remained well for eighteen years after a single course of x ray treatment. But endocrine therapy certainly has been a help. In some cases of thyroid dysfunction it constitutes the whole treatment, in others it is combined with static electricity with or without x ray. In still other cases great improvement has been obtained by the x ray and electricity and the frequency of these applications has been reduced to once in two or three weeks but still the patient is not quite well. Then the endocrine products combined with the x ray and electricity complete the cure.

CASE REPORTS.

Case I.—Mrs. B., aged thirty-two years, came to New York on September 14, 1905, from her home in Wilmington, N. C., accompanied by her physician, Dr. I. N. Love. There was slight enlargement of the thyroid gland, well marked Graefe's sign; pulse never below 120; such palpitation of the heart that it shook the bed; such tremor that she could not pour out a cup of tea, and great debility. X ray and high frequency treatments were given three times a week during September, October and November, and the last three treatments in December, with progressive improvement in the pulse, which was reduced to 90, and in other symptoms, and at her earnest solicitation she was allowed to go home during December, 1905, in time for Christmas. But this was only on condition that her physician should make daily reports on the pulse and other symptoms and that she would return for additional treatment upon receipt of a telegram. During the eighteen years that have elapsed no treatment has been necessary and she is in robust health.

Case III.—Miss W., a patient of Dr. C. Graham-Rogers, came to me on November 9, 1915, with slight enlargement of the thyroid gland, Graefe's sign, moderate tremor, pulse 112, palpitation not marked. The goitre was soft. Following my custom, I made radiographs of the teeth, which revealed marked apical infection of two lower molars. An effort to save these I believe delayed the cure by the x ray and high frequency currents, from November 9 to May 7, but this was affected and a few years later (August, 1918) she had remained perfectly well.

Case VI.—Mrs. P. was referred to me on March 31, 1922, by Dr. E. O. Lindenmuth, of Indianapolis, who gave the following history: Goitre came on gradually nine years ago, when the patient was in California under treatment for kidney trouble. She was operated upon one year ago in July. Pulse was 160 before operation and 120 afterward. She had a number of x ray and electrical treatments and felt better; sometimes her neck would look smaller and she felt stronger; she had been weak and nervous before the x ray treatments, and her pulse went down to 92 and 90. Her last x ray treatment, given in Indianapolis, was in October, and in March, when she came to me, radiographs of her teeth were normal; tonsils had been removed, as they had been found to be as a source of infection. When she exerted too much her heart skipped a beat, but after resting became better. The pulsation in the throat had not been noticeable nine years before. Blood tests did not show too many white corpuscles; last test was in October. A previous test with thyroid extract showed deficient thyroid secretion. She had had attacks of biliousness, her skin becoming greenish brown in color, but after the administration of laxatives would again be normal. Had one of these attacks on March 31, 1922, lasting three days, with palpitation and a pulse of 104, which went down to 98 after the third day. In August, 1922, she wrote that she was feeling much better; pulse was 74 to 78, and at night would be 84 or 86, and neck measurement was one fourth inch less. On October 13, 1922, she said she had a fit of indigestion for about a week and felt miserable. On November 9 her pulse was 82 and her weight 120 pounds; she had lost four pounds. Diathermy treatment was given to the liver. On November 23 she felt very well; pulse was 84. On December 7 she was feeling splendid and could do more work about the house; December 21, pulse 80, weight 120.

Since taking the x ray treatments here she said she had improved very much, was stronger, not nearly so nervous, pulse had gone down; liver acted better and she did not have the bilious attacks. Since the diathermy treatment she took only one grain of extract of cascara and one sixteenth grain of podophyllin; she formerly had to take calomel; her skin had a much better color, her appetite was good, she was keeping house, was a good deal more ambitious and did more work.

On January 4, 1923, she had another fit of indigestion, lost half a pound, and pulse was 90. After taking a cathartic pill three times a day with five grains of sodium bicarbonate, she felt much better on January 18th, only taking four doses of the pills; gained half a pound, pulse 88. On February 8th, was not feeling so well; pulse 84 in the morning and at noon 96, at night 100. Restless at night. On February 8th, x ray was administered and one grain of thyroid extract three times a day for a single day; pulse, two or three beats less; no change in physical condition except that she felt rather light headed, and later her pulse was 107 all day. During the next day she took the whole gland pituitary; her pulse was 100 all day. Began to feel better at 9 a. m.; next day after stopping pituitary pulse was 86 and she felt about as well as she ever did. I directed her to take pituitary regularly. On February 15th she took one half grain tablet of pituitary three times a day, every other day. On February 17th she said her pulse was 120 in the morning, she had a slight cold and was having some dental work done, but did not see why her pulse should soar in this manner. I stopped the pituitary for a couple of days and then told her to take it as previously directed. On March 23rd she weighed 124¼ pounds, pulse 84; on the preceding day her pulse was 76 when arising.

To recapitulate, x ray and electrical treatment according to the technic for hypothyroidism brought the pulse down to 84 and diminished the thyroid swelling and the exophthalmos and she became able to do her housework; constipation was relieved. Still, to the trained eye she presented the signs of exophthalmic goitre, and of course the x ray was not a thing which one would choose for indefinite continuance. A test made with the thyroid extract sent the pulse up to 107, and later the reaction to pituitary was found to be favorable. Accordingly, she was placed upon that as an adjunct to having x ray and electricity once in two or three weeks. Inside of two weeks a normal appearance was presented, with slender neck, clear complexion, and a sense of health and strength such as she had not had for years. She is still under treatment.

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Reports of Cases II, IV and V will appear in author's reprints.

Modern Methods of Hydrotherapy

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General medical practice is a broad field. If I were placed in the position of having to choose one single modality to meet the exigencies of daily practice in the acute and chronic disorders and diseases of which the human organism is afflicted, I would choose water as my weapon. No single drug, chemical, serum, vaccine, antitoxin possesses such value. No known hygienic or sanitary measure outstrips it. No physical modality can come within striking distance of this wonderful, flexible and powerful remedial measure. Internally and externally, it possesses effective values. It is the most valuable, in my humble opinion, of all physical measures of treatment, being equally useful in acute diseases and chronic states. It can be adapted to almost any ailment and any human being, no matter how strong or how weak. When, as the handmaiden of intelligent medicine, it is discerningly and scientifically applied, its results are more certain than ninety out of every hundred of the therapeutic drugs employed by the practitioner.

In spite of these facts, attested not by a few years of medical practice, but by centuries of accumulated experience and clinical knowledge, the great centres of medical investigations, the foundations, the laboratory workers, pass hydrotherapy by or treat it with the stern contempt and cold disapprobation of the medical stepchild, and refuse or overlook its vast value, and spend hours, days, months and years on the study of some chemical, some serum, some vaccine or microorganism whose field as compared to hydrotherapy is as that of the atom to world cosmos. This is not said to belittle any work of this kind, for every attempt to find any measure or means to combat disease, prevent death, lengthen the span of human life and contribute to that constitutional right, the pursuit of happiness, even though it be an *ignis fatuus*, is to be praised as endeavor whose purpose cannot be but laudable. But why pass by this ancient and glorious therapy, hoary with the accumulated clinical experience of past and present? Why not subject it to the modern laboratory study that its importance demands? Clinical truths and clinical success demand experimental and scientific verification of these facts, under the laboratory scalpel of the cold and cynical worker of today, freed from the enthusiasms of therapeutic success.

The laborer in the vineyard and the worker in the field of hydrotherapy know its value, and know what it will do, but they would like a scientific explanation, cleancut, definite and up to the minute, of the why and wherefore of this wonderful remedy. And its field of usefulness in medicine and therapy is but one phase or facet of its many possibilities. Its daily use is a preventive of disease, a sanitary measure of no small value, and it forms a corollary to athletics of no small importance. Everywhere we turn we find uses for water, from its cleanly and humble use in the culinary department, to its internal use by the direction of the physician. It is indispensable. It is the safest, best and one of the most effective cleansing agents used by moderns to cleanse highways, and byways, the alleys and the streets of cities. It cleanses the air and makes the land fruitful and crops plentiful. Water is cheap. It costs less in municipalities than any other necessity demanded by the growing needs of the people of today. Such a wide sphere of usefulness can be but indifferently covered in a short article and perforce such an article will be filled with the two deadly sins of commission and omission, leaving much to be desired by the reader.

Water is found universally; its temperature range varying from the vapor of steam to its crystalline state—ice—a range of some 150-165° F. It absorbs heat and cold rapidly, and in return rapidly loses its temperature content to the body with which it comes in contact, making it the agent *par excellence* for the application of thermic changes to the external surface of the body. Besides possessing a cleansing, antiseptic action, water by its own weight, when under atmospheric pressure, enables the hydriatrist to produce mechanical effects of varying degree, therapy influencing the peripheral nerve terminations. The ease and rapidity with which this agent may be changed and varied in a precise and certain manner, so that the attendant has under his control within a few seconds of time the temperature, pressure, form of application and duration, render it without question the ideal remedy. It is applicable to any, and all portions of the body with a precision and satisfaction offered by no other agent. Besides the undoubted scientific value of water as a physiological therapeutic agent, may be mentioned its easy accessibility and economy.

The physiological action of hydrotherapy is coextensive with the tissue and functions of the human body. Its responses may be made general or local, according to the extent and location of the application. Results vary according to the method of application, its extent, the duration, temperature, mechanical effects, and such procedures as precede and follow the treatment. Taking a normal or neutral line (94-96° F.), temperature effects are produced as we rise above (warm, 96-98° F.) (hot, 98-104° F.); (very hot 104° F. and above) or fall below (tepid, 92-80° F.; cool 80-65° F.; cold 65-55° F.; very cold, 55-34° F.) this line. The characteristic of the socalled neutral zone is the suppression of thermic stimuli, the cessation of cutaneous impressions, sedation and nerve rest. Above and below this line, the perturbations of the sensory nerve endings are conveyed to the central nervous system, giving rise to myriads of minute impressions, the registration of thermic changes with their resultant effects, viz., general, local, reflex, and transferred. The system rallies to meet the changes, responds to its fullest ability to throw off or counteract their effect, and we then have those wonderful and intricate phenomena known under the general term reaction, much more marked in its response to cold than to heat. The alternate application of heat and cold accentuates the response to each, where the application is made in proper ratio (1).

TEMPERATURE.

Upon the temperature of the normal body, heat may cause a rise from one half to one degree. This is rapidly counteracted in the normal person by the outbursts of perspiration, radiation of heat and heat loss through evaporation. The phenomenon is accompanied by increased vascularity, sensitiveness and reddening of the skin surface, due to dilatation of the bloodvessels. The immersion in a bath moderately warm may elevate temperature by the mere prevention of heat elimination. The primary effect of cold is to produce refrigeration, pallor, and chilliness of the skin surface accompanied by contraction of the capillaries. In the normal individual cold water causes muscular contractions, which produce heat, and if the application is short, the system responds so promptly that no practical reduction in temperature takes place. In febrile states immersion in a cold bath reduces temperature, as Winternitz has shown, when accompanied by sufficient vigorous friction to dilate the peripheral bloodvessels. In many delicate and chronically diseased individuals cold may act as a depressant of temperature unless care is taken to proportion the coldness of the water to the reactive power of the individual. Colder temperatures can be employed with less discomfort where mechanical stimulation is combined; for instance in the douche. Lately Pemberton and Crouter (2) have shown increased alkalinity of the sweat during heating procedures.

CIRCULATION.

Heat temporarily slows heart action, increases the force of the pulse, giving way rapidly to a quickened action of both, accompanied by dilatation of the surface bloodvessels, reddening of the skin, lowering of arterial tension and perspiration. Mechanical stimulation during the application of heat increases the effects reflexly. The internal bloodvessels are contracted reflexly, because the quantity of blood is relatively fixed. Cold is more decisive and rapid in its action than heat. It slows the heart's action, increases the rate of the pulse, and raises arterial tension. The bloodvessels contract, driving the blood from the surface, causing the skin to become pale and slightly shrunken. When reaction takes place the bloodvessels again moderately dilate in what might be described as a tonic state, so that the general vascularity of reaction following the cold application resembles closely the healthy condition of cutaneous circulation. Most of the results of thermic mechanical stimuli upon the bloodvessels are brought about more through reflex action than by any other means, as has been clearly demonstrated by both Schueller and Neumann. It may be noted here that the application of heat, followed by cold, produces a pumplike action beneficial in overcoming congestion or stases in any part of the body.

RESPIRATION.

Heat increases the average number, lessens their depth, diminishes oxygenation and carbon dioxide elimination. Where heat is inhaled, these effects are more rapidly produced. Cold when suddenly applied produces a spasmodic expiration followed by a deep inspiration; when slowly applied there is a great amplitude of the respiration, increased absorption of oxygen and elimination of carbon dioxide in the pulmonary capillaries. After reaction the respiration still remains deeper, there is experienced a sense of relief and fullness of the lungs. The added content of oxygen absorption has a wide influence upon general metabolic processes, especially in the reduction of the complex molecule to the simpler one suitable for elimination. Pemberton, Hendrix and Crouter (3) suggest that the value of heat externally may be due to the heightened output of carbon dioxide.

METABOLISM.

By metabolism we understand all those varied bodily changes that are necessary to the absorption of food, water, oxygen, and other materials, their appropriation by and through the agency of glandular, vascular and tissue action; the conversion of these to tissue use; and finally the reduction of complex waste materials into simpler compounds that elimination may take place, thus maintaining in the normal person a balance. A balanced metabolism evidences an intake and output that is just sufficient and proper to meet all the demands of functional activity, the repair of waste, the furnishing of sufficient force and heat, and the removal of the results of tissue waste. It must not be forgotten that an essential part of this process is the absorption of water from the gastrointestinal tract, and oxygen from the lungs.

The great channel by which pabulum is conveyed to the tissues and the detritus removed from them is the blood, which, as is well known, is the agent so necessary to the reparative process. Metabolism of tissue may be influenced by, 1, activity of function brought about by an increased quantity of blood circulating through the organ or tissue; 2, by change in the composition of the blood; 3, by increased blood pressure causing more blood to pass through the capillary walls and thus favor nutritive changes; 4, by elevating the temperature of the tissues; 5, by influencing the nervous system, especially the vasomotor and trophic nerves, which regulate the capacity of the tissues for absorbing nutriment. The effect of heat and cold upon metabolism is a difference in degree rather than in kind; heat acting less pronouncedly than cold. Heat effects are less likely to be permanent; it enhances the more powerful effects of cold, where it precedes. Cold water has a direct positive and unquestioned influence upon all metabolic activity. Tersely stated, we may say, that under hot and cold water applications we can expect a greater absorption of oxygen and elimination of carbon dioxide and extractives; increased quantity and better character of all bodily glandular juices; destruction of waste materials; the rendering of toxins innocuous; the rejuvenation and cleansing of tissue of such a nature as in a physiological sense, to cause the individual within his tissue to be born again. These results are brought about by the influence above noted through the action largely of the nervous and circulatory system. Pemberton and Crouter (2) have shown that heating the body surface of normal and arthritic persons, tends to produce increased alkalinity of urine, saliva and sweat, but no significant changes in the feces.

MUSCULAR SYSTEM.

Upon muscular tissue of both the striated and nonstriated varieties, hot and cold applications have a decided and rapid action. Heat relaxes normal and overcomes spasmodic states, while at the same time producing an enervation, the result of its general relaxing and atonic action. This is true in so far as tepid, warm and ordinary hot baths are concerned. Very hot baths, such as are constantly employed by the Japanese, and which occidentals stand poorly, have a very stimulating, revivifying and tonic effect resembling in this respect cold applications. Mosse by means of his ergograph and also Vinaj and Maggiora have demonstrated the fact that cold applications in health, as well as in fatigue and pathological states, increase muscular activity fully one third.

These statements apply to the brief application of cold water followed by reaction, for where cold applications are long continued muscular irritability is lessened and lassitude produced. That cold may act in a reflex manner upon the internal viscera is frequently evidenced by the fact that a general cold application, or even an application to the feet alone, may produce evacuation of the bladder. It is a common clinical observation that the application of cold water to the abdominal surface causes contraction and stimulation of the structures of the intestines, and is one of the most satisfactory measures at hand to stimulate secretion and overcome atony and constipation. Upon the muscular structure of the heart cold reflexly influences its action, decreasing its frequency, slowing the pulse and increasing arterial tension. Where used in conjunction with carbonic acid gas, as in the Nauheim baths, it decreases the area of dullness in the dilated and atonic heart, and by the increase of its activity brings about a physical hypertrophy. For these reasons alone hydriatic methods are among the most valuable means of toning the neurotic and muscularly fatigued people of this strenuous age.

BLOOD.

Intake and output may show many variations, but in health the water balance is maintained. No reasonable explanation has been offered to explain the mechanism of this balance. The problem does not seem to lie in the blood changes in tissue; water looms large. Rowntree has described symptoms attributable to water intoxication occurring without significant changes in body temperature, edema or marked increases in plasma volume. They resemble the symptoms of clinical uremia in many respects, and raise the question as to the possible relation of water intoxication, if any exists, to uremia, eclampsia and epilepsy. At any rate, the blood and kidneys no longer deserve sole consideration in the future analysis of the problem of water balance and transport in the organism (7).

Upon the blood its external application is pronounced. Heat stimulates leucocytosis and favors somewhat the elimination through skin and kidney, but as a rule it has little beneficial effect upon the general reconstruction of the blood itself, although where hyperemia is long continued by the action of heat, healing may be induced, but this is not so easily attained by hot water, as by connective heat or radiant energy. Cold, on the contrary, is one of the most valuable means we have of increasing the quantity of hemoglobin and at the same time its oxygen carrying power. As we have heretofore shown the respiration is deepened and larger quantities of oxygen enter the circulating blood. At the same time the cold drives into the circulation the corpuscular elements that have lain dormant in the interstices of tissues and thus adds a quota to the thickness and composition of the blood. Hot applications diminish, cold increases the alkalinity as well as the density or thickness of the blood stream, as has been demonstrated by Strasser. As a natural corollary to the above, we find that normal oxidative process and normal terminal waste materials are better prepared and therefore more quickly eliminated under these influences. Autotoxins, antitoxins, phagocytosis; the reparative and protective influences that lie in the blood cells and plasma are not alone augmented but made more active. With the increased circulation, better distribution of blood takes place, permitting of widespread action under favorable circumstances. Meakins and Davies (4) have shown that external heat increases the percentage of oxygen saturation of the venous blood, while Pemberton and Crowder show that the blood sugar falls slightly. Steuckgold (6) has found that the fibrinogen is increased after cutaneous heat, especially radiant energy.

NERVOUS SYSTEM.

Neutral temperatures (95 to 98° F.) shut out impressions upon the cutaneous surface, and by increasing the retention of water within the skin produces a succulency of nerve endings that result in sedation, a lessened irritability and a lack of stimulation. Heat relaxes the tissues, relieves pain due to spasm and increases the sensitiveness of a part when locally applied. The influence of a lengthened general hot application upon the nervous system is to produce oppression, excitation and a lack of vitality, which may approach prostration.

Cold generally applied and where graded properly to the person is in its action upon the nervous system, above everything else a tonic. Its action is enhanced by mechanical effects and after proper application there is not alone increased physical vigor, but mental as well, which when repeated will result in overcoming nerve exhaustion, irritability, weakness and that long train of psychosomatic symptoms so common in modern civilization. It is to be regretted that the busy, overworked, nerve strained, mentally worried and oppressed persons of this strenuous age do not turn with more frequency to the beneficial and restorative properties of cold water, rather than the brain obtunding, nerve destroying and health dissipating alcohol, drugs and opiates, that simply anesthetize the nervous system rather than remove the products of waste and which, where they are the result of fatigue, may become in turn a cause of disease.

REACTION: CONTRAINDICATIONS.

Following the application of cold the well known therapeutic reaction must be attained, and unless this is secured, save in the case of febrile diseases, the object desired has been defeated and the application robbed of its physiological and beneficial features. Reaction is coextensive with the structures of the human body, every tissue, cell and function feeling its influence so that the individual is strengthened, has a buoyancy and activity both mental and physical to which he has long been a stranger.

Judgment, tact, and a comprehensive knowledge of the particular case reduces the contraindications to a mimimum, but we may say that very hot and very cold baths are as a rule administered with caution in the extremes of life, youth and old age. Delicate persons must be trained and where this is done with care, little risk is entailed. Cardiac, vascular and similar diseases demand caution.

GENERAL THERAPEUTIC ACTION.

I shall only attempt to describe briefly the general therapeutic uses of water as applied to certain groups of diseases, and disorders. Its range is so extensive that it practically embraces the greater part of the domain of general medicine (5):

ACUTE INFECTIONS AND FEBRILE DISTURBANCES.

Typhoid fever, the general type: Free internal water drinking combined with the external use of the cold sponge with friction; the cool full, the tepid full or the neutral full bath all of them to be followed by the cold abdominal compress; the Brand method, the cold full bath at 65° F. for fifteen minutes accompanied by friction. All cool or cold applications must be applied with sufficient friction to develop a cutaneous dilatation of the bloodvessels. It results in a revitalizing of the individual as well as a reduction of temperature.

GASTROINTESTINAL AND HEPATIC DISEASES.

For acute cases general cold sponge for its revitalizing influence; the fomentation (135-160°F) for ten minutes, followed by the ice bag or a cold or stimulating compress to the area affected; may be combined with lavage and colon drainage. For the chronic ones stimulating compress; Neptune's girdle; alternating hot and cold applications; Winternitz's method, the dripping sheet, followed by a cold sitz bath. Probably the best general method is an application of convective heat or radiant energy, followed by the various forms of sprays and douches.

LUNG, PLEURA AND BRONCHIAL TUBES.

Pneumonia, stimulating compress at 60°F. repeated every one to three hours when the patient is awake; may be preceded by a brief fomentation and after the application of compress application, the ice bag may be placed over the cold compress at the places where the infection is greatest. For chronic conditions such as tuberculosis, feeding, fresh air, restricted exercises, combined with radiant energy in the shape of the electric light bath, followed by the various forms of tonic (cold) hydrotherapy; cold sponge, half bath and the various forms of the spray and douche. Watch temperature and reaction.

ACUTE INFECTION (TOXEMIA).

Free water drinking; alkalies and antirheumatics; sweating procedures, especially light and superheated dry hot air, followed by the stimulating compress to the affected joints. Hot full pack, fomentations, and other methods will be found useful. For chronic conditions sweating procedure; hot air, superheated dry hot air or radiant energy, followed by the various forms of sprays and douches, especially the Scottish douche to the various joints affected. Subsequent manipulations are valuable.

ACUTE DISEASES OF THE KIDNEY.

Hot full bath, full dry pack, hot air, superheated dry hot air and electric light baths to the point of profuse perspiration. As a rule cold application contraindicated save when cardiac weakness commences. Then apply the cold compress and ice bag to the precordium. For chronic conditions, moderate or limited water drinking; full wet pack, superheated dry hot air, incandescent electric light bath, followed by the cautious application of cooling measures. Nauheim and full neutral bath valuable.

DISEASES OF THE BLOOD.

Anemia may be taken as a type. General measures that first produce a hyperemia of the skin; hot air, superheated dry hot air, incandescent electric light bath, followed by tonic hydrotherapy among which may be especially mentioned the cold sponge, dripping sheet, half bath and the various forms of the spray and douche.

ACUTE CARDIAC DISEASES.

Moderate water drinking, the frequent application of the cold compress and ice bag over the heart. For chronic type the Nauheim bath associated with the various forms of exercise with which the name of Schott and Oertel are associated. Sprays and douches cautiously.

DISEASES OF THE NERVOUS SYSTEM.

Functional and nutritional diseases of which neurasthenia, psychoneurosis, headache and migraine are types, general measures that produce free elimination, increase circulatory activity and nerve reconstruction. General tonic hydrotherapy of all kinds; ablution, dripping sheet, full wet pack, half bath and various forms of sprays and douches. These may be preceded by any method by means of which heat may be collected upon the surface; hot air baths, incandescent electric light bath and other forms. For the chronic conditions, such as locomotor ataxia, avoid very hot and very cold temperatures; especially valuable are the half bath plain or medicated with friction to the limbs, and the whirlpool bath. As improvement takes place, we may proceed to use the different forms of douches.

MENTAL DISEASES.

Maniacal conditions are best met by full hot, warm or neutral baths, of rather long duration, continuous baths for hours, full wet pack. Where possible to employ it, general tonic therapy has been found signally useful in these cases, as well as in all forms of chronic mental manifestations. All drug, alcoholic, tea, coffee and tobacco habits demand preliminary preparation by sweating procedures until profuse diaphoresis is brought about, followed by tonic methods. During the removal the full warm or full neutral bath, full wet pack, fomentation, cold sponge, dripping sheet and other procedures may be employed. After removal tonic methods until fully reconstructed.

PELVIC DISEASES.

Acute: Hot normal saline douches, vaginal or rectal, every two or three hours, followed by a fomentation or pelvic pack as hot as can be borne. In the interim the ice bag over the inflamed area. This method may be combined with general cold sponge for its tonic effects and hot foot baths for derivative action. Chronic: Build up the general health by every known means using judiciously graduated tonic cold applications, in conjunction with the hot, warm or neutral vaginal douche, hot and cold packs.

SPECIFIC DISEASE AND ITS MANIFESTATIONS.

It will be found that nothing equals hydrotherapy as an adjuvant to arsenic, mercury and potash. Profuse perspiratory methods, followed by tonic hydrotherapy, will enable larger doses to be given or quicker results to be obtained with smaller doses. Nothing equals the incandescent electric light bath, followed by the various forms of sprays and douches.

Diseases of the skin of an inflammatory character and where due to inactivity or torpor of the internal eliminative organs or chronic inflammation of the glandular organs of the body and infections or depressed general health will be promptly benefitted by these methods.

SURGERY.

Hydrotherapy may act as an adjuvant in the upbuilding of the general health of the patient preparatory to an operation. It may act as an alleviant during the active postoperative period, and for the purpose of upbuilding the general health of the patient after the strain of the operation.

It may be stated in conclusion that in acute and chronic disease, no matter where located, we may expect with a reasonable degree of certainty that this method may ameliorate, relieve and often cure, when other methods fail. In chronic diseases of all known therapeutic procedures, it is probably the best single method we have at our command. It is a valuable adjuvant to all other physiotherapeutic methods.

The author's references will appear in his reprints.

Röntgenoscopy as a Cause of Menstrual Disturbance

By SAMUEL WEISS, M.D., F.A.C.P.,
New York.

Little mention is made in the literature of the dangers of prolonged exposure of the female organs during fluoroscopic examination, and no mention is made of menstrual disturbances as a direct result of these examinations. During the past few years I have come across a number of patients whose menstruation was disturbed after having undergone a complete gastrointestinal examination which included röntgenoscopy and röntgenography. Some of these were patients of mine, while others consulted me after having been x rayed by some one else. In every instance the history was similar. Menstruation was regular up to the examination and had not appeared since, in others it reappeared the following month or later. In still other patients there was spotting only. Two became pregnant who had been unable to become pregnant previously. One patient had severe pain during menstruation due to ovarian trouble; after two months her menstruation reappeared painlessly, and she now says that she is well and that her gastrointestinal condition has improved.

Seeking more light and confirmation, I spoke to a number of röntgenologists who were more than surprised to hear the statements I made, and in one or two instances was fortunate to have the patient present and confirm the facts. Some of these men had not seen the patient again after the examination was over, as they had been sent back to the physician who referred them, and the others did not recall having had complaint regarding menstruation. Further investigation revealed the fact that some röntgenologists do not fluoroscope their patients at all; some do so only during the ingestion of the opaque meal.

This may account for the lack of available data. My patients are given a thorough röntgenoscopic examination commencing with the chest and extending through the gastrointestinal tract. Plates are taken of the urinary system and gallbladder, followed by serial plates in the upright, prone, and oblique postures. The plating and examination are continued for five days or more and are followed by a contrast enema. During the fluoroscopic examination I always caution my assistant not to illuminate the entire field at once so that the patient may not be exposed unnecessarily, but it seems that even this precaution is of no avail in some patients.

Idiosyncrasy may be an important factor, as I have found that amenorrhea occurs more often in the phlegmatic and obese type of females. It may be due to some dysfunction of the glands of internal secretion which become affected through exposure to the rays. Most of these patients present all the phenomena of the menopause, hot flushes, etc. The longest case on record is that of a young lady of twenty-three who has not menstruated for three years, the second is of about eleven months' duration. Both of these patients have gained considerable weight. The others are more recent, as mentioned at the beginning of this paper, and while in several instances the menstruation recurred after the lapse of a month or two, other patients merely spotted.

Some of the gynecologists whom I have interviewed thought that this condition might be due to the destruction of the graafian follicles, while others ascribed it to nervousness and fright during the examination. Whatever the cause, the mischief has occurred and a remedy must be found to prevent it. I have prescribed ovarian, thyroid, and other glandular products without benefit. I have tried dietetic treatment, hot baths, etc., with no result.

In order that these disturbances may not occur in other patients I have perfected a simple device which prevents the rays from penetrating the female organs during röntgenoscopy and röntgenography of the gastrointestinal tract.

616 Madison Avenue.

Otitis Media and Mastoiditis Treated by Radiant Light and Heat from Electric Lights

By FRANK THOMAS WOODBURY, M.D.,
New York.

It frequently happens in practice, where facilities are limited, that the physician is put to it to improvise substitutes for apparatus which he requires for treatment. The following list of cases, of which the reports are meagre, will illustrate what can be accomplished with makeshifts.

The therapeutic virtues of radiant light and heat are now well known and are based upon physical laws equally well known, so that I shall not enter into their discussion further than to say that the energy of light penetrates the living tissues directly as the wave length, the time of exposure and the wattage of the source, and indirectly as the density of the tissues and the square of the distance from the source. This energy does work by being converted into longer obscure heat waves which are absorbed and carried by contiguity of structure and convection through the blood. This heat has a local effect upon cellular metabolism of the cells themselves and by reason of the heating of the cellular contents and the increased supply of invigorating blood. The increased blood supply is due to the well known vasomotor response to heat. Blood is the only medicine that nature has. No cure is possible without it. I speak of human beings of course. Therefore a supply of good blood being essential, if we can order such a supply we can influence the disease by fortifying the cells which are disabled.

Radiant light and heat is such an agent which we can apply. It is an energy which will do work in the body. The preferred method of applying it is by means of lights with carbon filaments giving off rays from the red end of the spectrum and below it having about five hundred candle power. This is for large skin areas. Local applications and effects may be obtained with fifty candle power lamps. Failing to have either of these at hand the ordinary mazda lamp will serve the purpose.

Case I.—J. L. A., male, single, aged twenty-six years, first seen March 29th. He was complaining of a swollen and running ear on the left side, with a temperature of 102° and a pulse of 132. The ear was discharging freely and the mastoid was swollen and tender. The condition had lasted less than twenty-four hours following a coryza. The patient was put to bed and the usual sanitary treatment of the external auditory canal, nose, and pharynx was instituted and continued at intervals daily. The left ear and mastoid region were irradiated by an ordinary desk lamp with reflector (60 watts, 110 volts) and kept irradiated until April 12th, when the mastoid gave no further evidence of disease. The sanitation of the canal continued until May 2nd when all discharge had ceased. Hearing was 15/20.

Case II.—H. F. N., male, aged nineteen years, first seen January 25th suffering from acute influenza complicated with acute mastoiditis, right side. He also suffered from intense abdominal pains with a boardlike hardness of both recti. As he had had several abdominal operations following appendicitis it was a question whether the symptoms were a part of the influenza or due to adhesions, inasmuch as there was constipation. The mastoid was put under continuous irradiation from a desk lamp and the abdomen was irradiated with six lamps in canopy arrangement. The abdominal pain and rectus spasm were entirely relieved inside of four hours. Mastoid symptoms were relieved by Feb. 4th.

Case III.—S. E., male, aged twenty-one, when first seen on February 4th had an acute suppurative otitis media, with discharge, and acute mastoiditis, both on the right side. The usual sanitation of ear and pharynx was prescribed and a desk lamp applied. In twenty-four hours there was marked improvement in all the subjective symptoms and by February 9th the mastoid was apparently well and the discharge had ceased. The patient was declared well on February 12th. He was then referred to a surgeon who found nothing requiring operative attention in the abdomen.

Case IV.—C. A. C., male, aged eighteen, when first seen on March 5th had a well marked catarrhal bronchitis, a right side suppurative otitis media with discharge, and an acute mastoiditis. Temperature was 104° F. He gave the history of a similar ear condition about three weeks before, which had apparently subsided under local sanitary measures. He also had a markedly sore throat and a general petechial rash over the front and sides of his body which merged into a general rash on the back. A diagnosis of atypical measles was made and the patient put to bed.

The usual attention was paid to the bronchitis and to the throat and nose, and the ears were irradiated with desk lamps. The patient was very septic and partially delirious soon after being put to bed. On March 11th the right elbow became inflamed and swollen. It was also irradiated and later given x radiation for five minutes on three successive occasions with a Coolidge tube, twelve inch distance, no filter, two and a half ma. and four and a half inch spark gap from a portable apparatus. At this date the mastoiditis had cleared up and there was but slight serous discharge from the ear. By March 13th the elbow symptoms had subsided entirely but the patient became progressively worse and died on March 15th. No autopsy was performed.

In all these cases there has been little if any impairment of hearing. The sanitation spoken of was an alcoholic solution of boric acid for the ears and a gargle and nose douche of tincture of iodine, five mils in 250 mils of normal (physiological) saline solution used hot and every hour.

Reports of Cases V, VI and VII will appear in author's reprints.

Editorial Articles

PHYSIOTHERAPY

The word physiotherapy is one of those high sounding forms of speech that cause the average person, professional or lay, to conjure up some mysterious medical means known only to the initiated. As a matter of fact we all use physiotherapy to a greater or lesser (usually lesser) extent. In putting a patient to bed we employ physical means of therapy of the greatest importance, for we change the mechanics of the circulation. In applying a surgical dressing we use physical treatment.

External applications of heat have long been employed in the form of hot water bags or poultices of various kinds. In this connection it is interesting and significant that the heat of the living body was formerly believed to be of an entirely different nature from that which emanated from any nonliving source. A puppy dog was considered a more effective therapeutic agent than a hot water bag, and the heat from a young human body was sometimes prescribed for the treatment of the elderly invalid.

Massage and both passive and active motions have been used more or less from time immemorial, as has also hydrotherapy. The morning cold plunge, which has been recommended for every ailment to which flesh is heir, is but a simple form of physiotherapy. Electricity, in some form or other, has had its vogue, as have sunlight and colored lights.

There have been elaborations in the applications of posture, movements, rubbing, heat, baths, electricity, and light, but after all there is little that is new, and because they do not savor so much of the occult as does chemiotherapy, if we may use the term for drug treatment, they have been neglected sadly by the profession, which has preferred to wield the prescription pen or the carving knife, to the neglect of means which are less mysterious and spectacular. As a consequence, practitioners with neither knowledge nor skill have been reaping a harvest by the hit or miss application of physical means. As we have said in these pages before, it is high time the profession was awakening to the importance of such therapy.

We have heard much more of physiotherapy since the war, in connection with injuries, and, indeed, its importation in this connection was one of the good things which we gained from the war. For a quarter of a century these means had been highly developed in Europe on account of the monetary importance of returning an injured workman to his job at the earliest possible date. The shortening of convalescence reduced the workman's compensation accordingly. When the war came the same machinery was ready prepared for application for the speedy return of the wounded man to his place in the ranks. There was nothing new about it except to American eyes. Since the war one hospital in this country, which deals to a large extent with the wounded from the ranks of labor and which has established an elaborate physiotherapy department, finds that, in its fracture cases, the saving in time of recovery, compared with their records under the older methods, is from ten to thirty per cent., according to the nature of the injury, while the recovery is, also, more complete.

But physical means are as useful in medical cases as in surgical, and even where they accomplish little directly, from a physical point of view, the very fact that *something is being done for the patient* produces an effect mindwards which reacts for speedy improvement or cure.

HEALTH AND LIGHT

The relationship between health and light is becoming more and more generally recognized as time progresses. Of course, the sun is known to be the source of life, but what is beginning to be known is the wonderful curative powers exercised by the rays of the sun, or rather, perhaps, the remarkable range of these powers.

While the warmth of the sun exerts a beneficial influence on vegetable and animal life, more importance is attached by medical science to the increasing intensity of its light, perhaps to the ultraviolet rays in particular. It has been known for considerably more than one hundred years that the green leaf is enabled to absorb carbonic acid from the air, not by the agency of the sun's heat, but by means of the sun's light. This may be termed the chemistry of the spring as applied to the vegetable kingdom. But the animal world, including man, responds to spring, and it is now believed that there is a chemistry of spring in the human body.

Experiments in this direction are said to have been proceeding for some time in Columbia University and at the Home for Hebrew Infants in New York. It is rumored that there has been discovered in the human body a chemistry of spring. Up to the present time these investigations have been pursued only in the case of infants. So far as they are concerned it seems to have been proved that there is an ebb and flow of the chemical contents of the blood. The long winter, with its comparative lack of sunshine and light, depletes the phosphorus content of the blood so that in March this content is at its lowest. From that time it rises steadily up to July, when it begins to ebb again. It is also said that relative darkness has a similar effect on the calcium content of the blood in infants. This explains why daily exposure to sunlight or to the rays of the arc lamp will increase the quantity of phosphorus in the blood of an infant with rickets. Consequently, it would appear that rickets is not a deficiency disease, in the sense that it is due to a vitamine deficiency, or even entirely to a dietetic deficiency, but that a lack of light is as much, if not more responsible, for the condition than a want of certain elements in the diet.

It has been emphasized on several occasions, in the editorial pages of this journal, that rickets does not seem to be a disease of either diet or of insufficient light, but is rather the result of both these causes. It is difficult to estimate which bulks most largely. Recent evidence points somewhat to lack of light. The effect of sunlight in certain diseases of children, tuberculosis for instance, is astonishingly good and from this fact a moral may be drawn, namely, that it is criminal to rear children under the conditions prevailing in many cities. In some sections of down town New York the streets are like mountain canyons into which the sun never penetrates properly. Other streets densely populated, with overcrowded tenements in the lower East Side, are darkened by the elevated railways. Now that our conceptions of the paramount value of sunlight have been widened and deepened, such things should not be allowed to exist. Children who suffer most severely, often permanently, from want of sunlight, should not be denied their right of benefiting from its rays. The sun is life and the boy or girl who does not have a fair share of sunlight is robbed of the greatest gift to which human flesh is heir.

TRAUMATIC RUPTURE OF THE INTESTINE.

When a man has been kicked in the abdomen and continues to feel pain, he should be kept under close observation until all danger that he has suffered a rupture of the intestines has passed, even if he does not seem to be acutely ill. No one can read A. L. Lockwood's study of 652 cases of traumatic rupture of the intestines in the *Canadian Medical Association Journal* for May, 1923, without being impressed with the importance of this dictum. The extent of injury to the abdominal wall furnishes no indication of the amount of damage to the viscera, and symptoms of rupture may not appear for fifteen, twenty, or even more hours, particularly when the intestines happen to be empty when they are ruptured. Although shock develops at once in most patients, it may not occur at all, may develop later, may clear up quickly, or may pass on to secondary shock, even when the rupture of the intestine is complete. In quite a large percentage of the cases the early symptoms are so slight that both surgeon and patient are lulled into a false sense of security until peritonitis excites alarming symptoms and operative measures are undertaken too late.

The small bowel is ruptured much more frequently than the large, in the proportion of nine to one. After complete rupture of the small bowel the mucous membrane usually everts through the aperture and tends to prevent leakage, while peristalsis is inhibited for about six hours. The best chance of a recovery is given by an operation performed within these six hours, for it is practically certain that a patient who has a complete rupture of the intestine will die unless he is operated upon quickly. Delay is fraught with danger when the few, but characteristic, symptoms of rupture are present. Delay until the abdomen is distended and the liver dullness absent deprives the patient of his only hope of recovery, for last resort surgery is useless in these cases. That is why immediate surgical intervention should be urged in any doubtful case, even though the operation may be purely exploratory.

MEDICINE AND THE HUMANITIES

This title Dr. Charles L. Dana, orator at the recent memorial meeting for the late Dr. Weir Mitchell in Philadelphia, gave to his address, published in a late issue of *Annals of Medical History*, and a valuable contribution to medical theory and practice. Dr. Dana is peculiarly well fitted to discuss this subject. He mentions some of the fields of Mitchell's scientific and practical achievements in medicine, then adds: "But in particular he showed the value of the personal equation, in applying our art in practice . . . he was the father of the best modern phases of psychotherapy and in particular he showed how much the nontechnical side of the physician and his cultured values have power to accomplish."

Dr. Dana deplores the tendency of the whole of modern medical education to enlarge and emphasize the technic and to ignore the human side. We are shy of culture today, perhaps because it has been spelled with a K. A person with culture has enough knowledge of the art and learning of present and past times to have what is called a background. "Weir Mitchell, without ever losing his laboratory habits or scientific methods of thought, could not only acquire, but also contribute cultural interests to all those with whom he came in contact." Something can be put into medical education, besides technical studies, which will promote efficiency, usefulness, and happiness throughout a doctor's whole career. A person with this sort of culture will be likely to have mental balance and sanity in his beliefs and ideals. Because of a lack of this background we in America are preyed upon by a succession of wasteful emotions; "a real, serious, simple, cultural training of our adolescents would clear the subconsciousness of irrigating complexes and the activities of desire much more than introspective studies of a morbid personal past. . . . I would go back to nature or to the classical past, rather than to infantile memories." Of course there must come some selfrestraint, and some serious and perhaps dull hours of work, together with certain inhibitions and repressions and some uncongenial concentration; for education would not exist if there had been no enforced guidance of the developing mind. "Surely no one has to have more inhibitions cheerfully sustained than a successful medical personality."

Dr. Dana believes the science of medicine has received its chief impetus from the great classical periods of culture and civilization. He reviews some of the great nations of the world and their contributions to medicine. The Chinese, never having got outside of themselves, and born chiefly to become ancestors, added nothing to medicine. The same thing is true of the other ancient civilizations which were racial and specialized in scope. But the Greeks attained to two peaks in medical progress: the Hellenic, at the time of Hippocrates, and the Alexandrian, when anatomy was studied and dissections were made. In Rome, when culture was at its height under the five good emperors, Galen appeared and lifted medicine to so high a plane that he practically isolated himself, his science, and his art; medicine remained there for about a thousand years.

After the dark but fecundating Middle Ages, medicine was born again in the anatomical work of Vesalius and the surgery of Paré, Paracelsus rediscovered Galen, Servetus found the circulatory system, Eustachius made an anatomy, Fabricius at Padua was teaching Harvey, and Linacre was lecturing at Oxford. But it was not until the nineteenth century that medicine really arrived, and that there was a medical science as well as an art; and this in the Victorian age, so frequently classified, from the cultural point of view, as mediocre, but in which at least humanism and the humanities were definitely pervasive.

Leaving the historical aspect of the subject, Dr. Dana closes his paper with a plea for adding to the medical curriculum such kinds of avocational study as help to make the doctor more human—"studies which make him love his patient more than the disease, and to realize that patients like being caressed rather than being diagnosed. This is forgotten—therefore we have the chiropractors." To have a cultural background means a wise development and training of our higher faculties, and through these such control that we can adjust ourselves to the conditions of life, or change them by our own activities, thus making environment adjust itself to us.

CLIMATE AND CHARACTER.

To say that climate exerts a great influence on the formation or deterioration of character, is to repeat a truism. But exactly why a tropical climate should have such a demoralizing effect upon the character and mental characteristics that it does is not known exactly. Dr. Leonard Williams, lecturing recently at the Royal Institution, London, on the physical and physiological foundations of character, endeavored to solve some of these vexed questions. He explained the inability of the white man to adapt himself to the colored man's country. It is known that this is largely a matter of skin pigmentation. The function of the pigment in the colored races is to intercept the active rays, thus the deleterious effect of the solar spectrum at a certain angle on human beings is counteracted by the pigment. In India, for instance, the inhabitants show a varying degree of pigment, and accompanying this difference is a marked difference in character and characteristics. As pigment varies with climate, so does character vary.

Dr. Williams defined character as conduct so frequently repeated as to become automatic. Different climates determine a different type of people. Those who inhabit a country where the mountains run down to the sea are superstitious, imaginative, and realize how infinitesimal any man is in the ultimate scheme of things. Mountain people are short and so are their animals, as may be seen in the Shetland, Devon, and Welsh ponies.

But to return to the matter of pigment, the lecturer suggested that the pigmentary adaptation to climate is very costly in the matter of energy. That the copious deposit of cutaneous pigment in the dark skinned races is responsible for a considerable expenditure of nervous energy and helps to explain their characteristic lethargy. In short, that the energy expended in the development of color is so considerable as to deprive other parts of the organization of its fair share of that energy and that those parts which are almost certainly nervous parts, are unable to develop beyond the merest animal needs of continued existence. He argued that the energy thus diverted in case of the dark skinned individual, and the darker the skin the less the energy, in the case of the fair skinned person is available for other purposes. Therefore, in the opinion of Dr. Williams it is not difficult to understand the white man's superiority over his darker brother and the ability to develop his nervous system in a degree impossible to his dusky fellow; but he pays a high price in tropical diseases in respect to his fair skin. On the other hand, the energy expended on the skin in pigment protects against disease peculiar to the tropics. On this account, Dr. Williams somewhat distrusts the wisdom of Kipling's advice to take up the white man's burden. Or rather, he thinks that he did not fully understand the almost intolerable weight of that burden. Stated bluntly, the conclusion to which we are driven by this consideration is that the white man is not by nature adapted, and therefore is unable by art, to adapt himself to the colored man's country.

Climate is the reason why the British are great colonizers. Their white skin, according to Dr. Williams's theory, has given them reserves of energy which has lured them to the farthest ends of the world, where, by service and sacrifice, they hope to establish themselves and their British civilization. But their service and sacrifice are destined to ultimate defeat by the very economic forces, which, owing to their ignorance of them, they have failed to recognize. Their white skin is at once their glory and their undoing. They confer on them nervous systems that make them commanders, but at the same time, give them a handicap that they can never overcome. As the writer of "At the Periphery" in the *Medical Press and Circular,* May 9th, last aptly puts it, "Nature has not placed a black man in Australia and a red man in America, just for the fun of the thing." In the course of many generations the British inhabitants of Canada and the British dominions will have deviated so far from the British type as to appear to belong to a different race. In this country it is well known that a few generations have sufficed to modify profoundly the British immigrants. Also it has often been remarked that Americans, whose ancestors have lived in the country for generations, seem to have reverted to or taken on many characteristics of the American Indian, such as high cheek bones, hairless faces, dark, smooth, straight hair and so on.

There is one effect of the climate of this country worthy of analysis and comment which Dr. Williams adduced as an example of profound modification, namely, that after three or four generations white women become sterile. This is a question of extreme interest and importance and a statement perhaps which he did not intend to apply to a vast country in which there are great variations of climate. Possibly some of our readers may like to discuss this point.

Again, the question of the loss of hair is another point of intense interest in man's evolution. At the present time man is the only completely naked animal and in the earlier stages of his existence was protected by a hairy covering. How then did he come to lose his hair? While this problem has not been solved the writer of "At the Periphery" brings forward the ingenious suggestion that the loss of the hairy coat of man took place while the evolving human was inhabiting a warm part of the world. He goes on to point out that *pari passu* with this loss one would expect an increasing pigmentation of the skin to have occurred, of course, extreme hairlessness and extreme pigmentation of the skin are among the main physical characteristics of the negro.

Man adapts himself to climate or climate compels adaptation and influences the human being, physically and mentally. Civilized man is influenced also by the environment, irrespective of climate, mentally and physically, although climate is the most potent factor in this direction. Dr. Leonard Williams's lectures were suggestive, stimulating and fascinating and the hypothesis as to the cause of climate controlling character through the cutaneous pigmentation is worthy of close consideration. Anything which leads one to exercise the reasoning powers outside the dull routine of money making or the not too clean game of politics should be encouraged. It is healthy mental exertion, although it may not bring material gain, fame or notoriety.

THE MOSQUITO AND MALARIA

The discovery of the relationship between the mosquito and malaria is perhaps the most important medical discovery ever made. Malaria has been in the past and is at the present time the most widely disseminated and most prevalent malady of the world, and while there are diseases more quickly fatal there is none that produces greater deterioration in a race or works more lasting harm than malaria. In any country in which malaria gains a hold, there is a progressive deterioration of its people. Malaria is said to be the true cause of the decadence of ancient Greece, and there is little doubt that if not the only cause it was a potent factor in the downfall of the most cultured nation of all time, with the possible exception of the Egyptian dynasty. However, the prevalence of malaria and the injury wrought by it are too well known to medical readers to need emphasis or elaboration, and the statement that the discovery of the connection between malaria and the mosquito is the most important medical discovery ever made is not an exaggeration. It consequently follows that the man who made this discovery is one of the greatest benefactors of the human race.

Interest in the subject of malaria has been aroused recently by the publication of the memoirs of Sir Ronald Ross, the discoverer of the tie which linked the mosquito with malaria, the man who solved the problem. The story of how he brought this about is fascinating and is indeed a romance of science. Ross was the discoverer in so far as in the face of innumerable difficulties he worked out the problem to a successful issue. Laveran, the French Army surgeon stationed in Algeria in 1878, actually discovered and described accurately the malarial parasite as it appeared in the human blood. Golgi continued Laveran's work and Manson suggested to Ross that mosquitoes carried malaria as they did filaria, and Ross proved that Manson's idea was absolutely correct. Full justice was rendered to Ross. When the Nobel Prize was presented to him, Professor Mörner, the rector of the Caroline Institute said: "By your discoveries you have revealed the mysteries of malaria. You have enriched science with facts of great biological interest and of the very greatest medical importance. You have founded the work of preventing malaria, this veritable scourge of many countries."

The solution of the malaria problem led the way to the discovery of the relationship between the mosquito and yellow fever made by the American, Reed, and incidentally these two discoveries applied by Colonel Gorgas rendered possible the construction of the Panama Canal and have robbed the tropics of some of their terror.

INCREASING MORTALITY FROM DIABETES.

The recent greatly increased interest in diabetes, due to the discovery and use of insulin, makes timely the recognition of the fact that mortality from this disease has increased considerably for fully twenty years. Since 1919 the rise has been continuous.

The Census Bureau has recently published some interesting figures showing striking geographical differences in the mortality rate resulting from diabetes. Tennessee has the lowest rate for the white population—a little over six in one hundred thousand of population. New York shows the highest—nearly twenty-two in one hundred thousand. New Jersey, Pennsylvania and Massachusetts also show very high rates, while the southern and western states as a whole show low figures.

These geographical differences are in accord with medical findings concerning the disease. It is well known that white persons are much more susceptible to diabetes than colored persons. This fact accounts for the higher death rate in the northern and eastern States than in the southern. It is also known that susceptibility to the disease varies greatly among the several white nationalities. The Jews and the Irish seem especially susceptible to the disease, and the population of New York and New Jersey contain large number of these two stocks. Also, the diabetes death rate rises rapidly with advancing age, so localities where there is a large proportion of old people will give a high rate. This probably accounts for the high death rates from the disease in Maine, New Hampshire and Vermont, where there are more old people than in many of the other States. Another well known fact is that there is a much higher incidence of the disease among women than among men.

MEDICINE IN THE DEPARTMENT OF PUBLIC WELFARE.

The *Weekly Bulletin* of the Department of Health, of the city of New York, publishes in a recent number a summary of medical progress in the Department of Public Welfare as recorded in the latest annual report. It may be of interest to give a brief review of this summary.

During the year, 46,812 persons were admitted to the hospitals. Treatment of these patients involved 10,268 operations. In addition to these cases, 25,128 wards of the city were given treatment in private hospitals. In private child caring institutions on December 31st, there were 15,837 normal children; the number of subnormal children in the department's charge was 1,381.

One of the policies established during the year, which has already shown excellent results, is the holding of regular conferences of the attending physicians at all the hospitals under the jurisdiction of the department. Here the physical and medical histories of patients are carefully gone over, and treatment and results are discussed. To facilitate these discussions, it became necessary to establish a practical and uniform system of case histories, so competent persons were assigned to take charge of these records at all the hospitals, and specialists were appointed to supervise at the central office the whole collection and coordination of medical and surgical statistics.

A uniform system of nomenclature has been established as an accessory to the proper preparation of statistics and records such as those mentioned above. An active campaign has been inaugurated to call attention to the advantages and opportunities offered by the four schools of nursing maintained by the department.

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News Items.

Health Day Celebration.—June 13th was Health Day at the city's jubilee exposition at the Grand Central Palace. Dr. F. J. Monaghan, health commissioner, was one of the official hosts.

Dr. Banting Listed for Annuity for Discovery of Insulin.—Dr. F. G. Banting, of Toronto, discoverer of the insulin treatment for diabetes, was listed for an annuity of $7,500 in supplementary estimates announced in the House of Commons by the Minister of Finance. Premier Mackenzie King has announced that he intends to move in the House for recognition by Parliament of the work of Dr. Banting, to permit the scientist to devote his life to medical research. The Canadian Medical Association at Montreal passed a resolution of thanks to Dr. T. C. Banting, for the discovery of insulin. The Ontario Government has also done so.

Sanitarians Meet.—The twenty-second annual conference of sanitary officers and public health nurses with delegates of the State Department of Health was held at Saratoga Springs on June 26th, 27th and 28th. Many distinguished physicians and sanitarians were present.

Graduate Course at Denver.—A graduate course in ophthalmology and otolaryngology will be given at Denver, Colo., from July 16 to 28, 1923, under the auspices of the Ernst Fuchs Society, the Colorado Ophthalmological Society, and the Colorado Otolaryngological Society.

Will Reopen Hospital.—The former Veterans' Bureau hospital at Dwight, Ill., which has been the centre of a long controversy, will be reopened at once and will be used for the treatment of the milder neuropsychiatric cases. The director said the institution probably would be purchased by the government.

Patient Exposed to X Ray Fifty-six Hours.—The longest experiment on record in the treatment of cancer by x ray was completed in Bellevue Hospital by Dr. I. Seth Hirsch. The patient was exposed for fifty-six hours to an x ray of 250,000 volts. Dr. Hirsch said that several weeks would be required before he could determine whether the experiment was succssful.

Dr. Bowman C. Crowell Elected.—The dean of the Jefferson Medical College announces the election of Dr. Bowman C. Crowell, of Charleston, S. C., as professor of pathology in the Jefferson Medical College, to succeed to the position formerly occupied by Dr. William M. L. Coplin, at one time director of public health and charities of the city of Philadelphia, who resigned from his college position a year ago.

Announcement.—The *Journal of Medical Research* announces that owing to the death of Dr. H. C. Ernst it has now become the property of the American Association of Pathologists and Bacteriologists. The journal will be published in the future by a board of editors appointed by the council of the association. It will be devoted to the prompt publication of original observations and investigations in the field of pathology.

Insulin Fund.—A contribution of $150,000 to fifteen hospitals in the United States and Canada to promote the use of insulin in the treatment of diabetes is the gift of John D. Rockefeller, Jr. Presbyterian Hospital, New York, is the largest beneficiary, receiving $15,000. Thirteen other hospitals get $10,000 each, and $5,000 is contributed to the University of Toronto Banting-Best Fund. The list of hospitals was selected by a committee under the chairmanship of Dr. Simon Flexner, of the Rockefeller Institute.

Honorary Degrees Conferred.—Amherst College conferred the degree of Doctor of Science on Dr. John B. Walker, professor of surgery at Columbia University, and on Dr. James Ewing, professor of pathology at Cornell University.

Yale University conferred the degree of Doctor of Science on Dr. Walter Bradford Cannon, professor of physiology at Harvard; Dr. Jacques Loeb, head of the department of experimental biolody of the Rockefeller Institute for Medical Research; and Henry Fairfield Osborn, of the American Museum of Natural History.

Dr. Woodman to Head Upstate Hospital.—Dr. Robert C. Woodman has been nominated by the State Hospital Commission to be superintendent of the Middletown State Hospital as successor to Dr. M. C. Ashley. Dr. Woodman has been first assistant physician of the hospital for years.

Negro Staff Chosen for Soldier Hospital.—A complete negro personnel will man the Veterans' Bureau Hospital at Tuskegee, Ala. The question of whether negro physicians should make up the staff of the institution, which will receive negro patients, has been the subject of controversy. There was strong feeling among the Tuskegee white citizens against such a plan but according to reports the staff appointments have almost been completed.

Dr. W. J. Mayo Sails for Honors Abroad.—Dr. W. J. Mayo, head of the Mayo Clinic at Rochester, Minn., sailed for Europe to receive degrees and other honors which have been awarded to him by universities in recognition of the work he has done for humanity by his skill in surgery. Dr. Mayo arrived in New York from Montreal, where the Doctor of Laws degree was conferred on him by McGill University. He will go to Dublin, where the Master of Surgery degree will be conferred upon him by Trinity College, University of Dublin. At Leeds, England, he will receive the degree of Doctor of Science from the University of Leeds.

Stage Folk to Have Hospital.—A hospital for the exclusive use of the people of the stage, including the spoken drama, vaudeville and motion pictures is to be built by the New York Theatrical Hospital Association. The association was organized recently. Every branch of the stage profession or industry was represented and Dr. McCall Anderson, 55 West Fifty-fifth Street, was elected chairman of the executive committee. The medical staff consists of Dr. Joseph A. Blake, Dr. McCall Anderson, Dr. Evan Evans, Dr. Walter E. Lambert, Dr. Joseph C. Taylor, Dr. William Brown Doherty, Dr. H. Steers Holland, Dr. Charles Gilmore Kerley, Dr. Floyd McDaniel, Dr. W. Broaddus Pritchard, Dr. Andrew Robinson, Dr. Royal Whitman, and Dr. A. J. Walscheid.

New Officers for Association for Relief of Needy Physicians.—The Association for the Relief of Needy Physicians of Central and Eastern Europe announces its new officers as follows: Honorary president, Professor William H. Welch, president, Johns Hopkins University; honorary vice-presidents, Professor Harvey Cushing, of Boston; Dr. Albert Ochsner, of Chicago, and Dr. Willy Meyer, of New York; president, Dr. Max Einhorn; treasurer, Dr. Henry C. Steneck, and secretary, Dr. Walter F. Bopp. The central committee is composed of the following members: Clifford V. Brokaw, Dr. Harlow Brooks, Dr. Warren Coleman, Max Binswanger, Dr. Wolff Freudenthal, Dr. Jacob Kaufmann, Dr. Fredrick W. Knowles, Dr. William H. Luckett, David Mackenzie, Dr. Robert T. Morris, Fairfield Osborn, Dr. Willy Meyer, Mrs. William Decatur Parsons, Prof. Franz Boas, George Foster Peabody, Mrs. Alvin Scheuer, Mrs. Max Einhorn, Dr. Norbert Stadtmuller, Dr. William H. Stewart, David B. Simpson, Dr. Gregory Stragnell, Dr. Franz Torek, Oswald Garrison Villard, Hugo Volkening, Dr. Ernst Danziger, and Gustav Vintchger.

BERMUDA AS A SUMMER RESORT FOR PHYSICIANS AND THEIR PATIENTS

By E. C. Wilkinson, M. D.,
Hamilton, Bermuda.

The physician who has longed for a glimpse of the tropics has been keenly aware of the fact that during the winter months, his patients, alas, grant him no vacation. And in the summer the tropics have been unthinkable as a vacation resort, because of the burning glare of the midsummer tropical sun.

There is always an answer to the hardest problem, in the back of the book or somewhere. I think that the solution of this summer problem of the physician is geographical and geological, and that it is Bermuda. Here is a group of about 365 islands, situated roughly 600 miles from the nearest land, which is South Carolina, 660 miles from New York, 700 from Halifax, and 700 from the Bahamas, a unique country resting on the top of an extinct volcano and built above sea level only by the work of billions of coral insects throughout countless ages. We are just forty-eight hours from New York, by steamship, and in summer Bermuda is more comfortable than New York, and usually much cooler. Bermuda is really semitropical, because it lies well north of the tropic of Cancer—yet in scenic charm it is, to create a paradox, more tropical than the tropics.

Here, then, is a unique combination, a land situated in the middle of the Western Atlantic, in the coolest imaginable summer setting, yet enjoying a luxuriant wealth of tropical vegetation, exotic flowers, and all the beauties of landscape and sea that one associates with countries and islands much farther south. One of the many riddles of Bermuda is that it looks as if it had been picked up out of the Caribbean Sea, from which, however, it is separated by over a thousand miles of the Gulf Stream.

It is so far north that the average temperature in summer is only 77 degrees. The climate is equable, ranging even in July and August between the narrow limits of three degrees. This may not seem cooler than New York, but in reality it is, because it is never intensely hot in Bermuda. On the mainland there are many days when those twin villains, General Humidity and Old Sol, conspire to produce an intolerably hot and humid condition. This never happens in Bermuda, because its mid-Atlantic location ensures a cooling breeze throughout every day, all day long and all night too. Cool nights, and days swept by ocean breezes may sound too good to be true, but they are the invariable rule in Bermuda.

For physicians and their patients, who seek rest, Bermuda is a haven of quiet, undisturbed by noise. Here are no automobiles, motorcycles, railroads, street cars or factories. And of course no dust or dirt, really the cleanest possible place as well as the quietest. This is a splendid place for nerve cases, but is not recommended for patients with pulmonary complaints, because for some reason it affects them unfavorably. In my own practice I have had many cases which were almost unbelievably helped by the change from the city life to the quiet environment of Bermuda.

It pleases me, as an old resident of Bermuda, to note the increasing numbers of physicians who are visiting our little country every summer. The physician is of course interested largely in the climate and other characteristics of any country which have a bearing upon its suitability as a resort for his patients, but he is a human being himself and when he goes away for rest and recreation he wants to know something about sports, scenic attraction, and the like. So, after a paragraph or two about climate and diet, I shall talk quite frankly about the nonmedical charms of Bermuda.

There is something about the air in Bermuda, during the summer, that invigorates and revivifies. The doctor who sends to Bermuda a patient who is on a diet may find his rules ignored, because the climate has a demoralizing influence upon the appetite, it must be confessed. The most determined dieter eventually yields to the lure of five o'clock tea, with cinnamon toast and marmalade. The fresh vegetables, particularly the famed Bermuda potatoes and onions, will prove palatable to patients who have been told to abjure or limit meats and other proteins.

There is some difference of opinion among physicians regarding the therapeutic value of alcohol. Patients whose cases seem to demand a ration of alcohol may be sent Bermuda safely, because we are a British colony and here the Eighteenth Amendment does not apply.

Restful and soothing to tired eyes, are the miles and miles of tropical flowers in full bloom. During the summer season the rare Bermudian flowers are in their greatest abundance and most colorful bloom. Every roadway and path is bordered with blossoms —gorgeous banks and hedges of oleanders, hibiscus, poinciana, and bougainvillea, set against a background of countless hills covered with juniper trees, and adorning tiny islands set, like jewels, in a multicolored sea.

Even the water takes to itself more colors than Joseph's coat, and changes its hues, chameleonlike, with every passing influence of cloud and zephyr. Due to the coral formations, this crystal clear water reflects many tints of green, blue, cream and brown, blending in tones that suggest opal, turquoise, and topaz.

Other delights for the observing eye of the physician, are the natural marvels, including the crystal caves with their beautiful stalactites, stalagmites, and quasihuman formation; the sea gardens of coral vegetation, inhabited by fish of fascinating hues and form, and the natural arches, cathedral rocks, "devil's hole," and numerous similar phenomena.

The up and doing visitor will find in Bermuda every opportunity for every outdoor sport and the best of the indoor ones. Every day throughout the year, we can enjoy surf bathing in the cleanest, clearest water, and there is excellent still water bathing for those who prefer it. Sailing, canoeing and fishing—296 varieties of fish, by the way. Tennis on turf and concrete courts, and golf on eighteen hole courses with the best of club facilities, available to guests of the hotels. Tournaments are held frequently, and prominent golf and tennis players participate. Cycling, driving, and riding on white coral roads. Sightseeing along pink and white beaches, over sand dunes, in rambling lanes, from the towers of stately lighthouses, in seventeenth century estates, and among the British forts that sweep all of the Bermudas from their lofty heights.

And now for the details of how to get to Bermuda and what the trip should cost. Well appointed steamships of ample tonnage sail twice a week during the summer travel season. The sea is usually mild in summer, and dancing on the deck is a popular diversion. The two day voyage is not too long. There are low cost, inclusive tours, which provide steamship transportation, hotel accommodations and meals, and all desired sightseeing trips. These tours range from eight days to nineteen or more, and the complete cost starts as low as eighty-three dollars for eight days, based on the minimum round trip steamship rate of fifty dollars.

The doctor with a hobby, who likes to learn even while on a vacation, will find in Bermuda a rare hunting ground, a fertile field for studying history, geology, botany, zoology, biology, and even ethnology. Apart from the wealth of natural data available for first hand study, the libraries and societies have excellent records and exhibits, which have been collected for hundreds of years. The bibliography of Bermuda is extensive and varied, and the physician with an inquiring mind will, I believe, find rare delight in it.

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Foreign Correspondence.

LATIN AMERICA LETTER.

(*From our own correspondent*).

Balboa Heights, *May* 31, 1923.

TREATMENT OF LEPROSY AT THE PALO SECO COLONY.

Colonel H. C. Fisher, M. C., U. S. A., the chief health officer of the Panama Canal, in his annual report for the calendar year 1922, gives some interesting data on the results obtained in the treatment of leprosy at the Palo Seco Leper Colony. This work was conducted under the immediate direction of Dr. Philip Horwitz, three days in each week being allotted to specific medication. On one day intramuscular injection of the ethyl esters of chaulmoogric acid was given to practically every inmate, the exceptions being those who, by reason of extreme age or physical condition, were unable to take the treatment. On the two other treatment days, the intravenous method was used in about twenty-five per cent. of the cases, in addition to the intramuscular injections. A few were given intravenous injections only. Both methods were founds to possess distinct merits. The intramuscular injections are slowly absorbed over an extended period and subject the patients to the continuous effect of the drug, while the intravenous injections are rapidly absorbed, thus bringing large doses in contact with active areas, but being just as rapidly eliminated, they must be frequently repeated to be of value. The combined method has proved most effective. For all ages from ten years, five c. c. was found to be a practical dose by either route, although in the weak and the young smaller initial doses were given. Larger doses were administered to a few patients, the dose being increased to forty-eight c. c. weekly, divided into twenty c. c. in one intramuscular injection and fourteen c. c. in two intravenous treatments. These larger doses could be tolerated for short periods only and the method was abandoned. Owing to the extreme hypersusceptibility of leprous patients to potassium iodide, which causes dormant lesions to light up and the causative organism to reappear in the nasal discharges, this drug was administered in ascending doses up to a maximum of twenty-four gms. daily, to test candidates for parole.

On the whole the treatment with the ethyl esters proved of value in arresting the progress of the disease and in ameliorating it. This was particularly true when the combined intravenous and intramuscular method of injection was employed. On January 1, 1922, there were seventy-eight patients in the institution and during the year there were eleven admissions. Of these eighty-nine, seven died and five were paroled. Four of the paroled patients had the nervous type of the disease and one the tubercular. Of the eleven admissions, eight were new patients and three were readmissions. Two of the latter were patients who absconded in 1919 and one was a voluntary readmission. This was a patient who had been paroled during the year.

YELLOW FEVER AT BUCARAMANGA, COLOMBIA.

The presence of an epidemic of unknown origin at Bucaramanga, Colombia (a mining centre about one hundred miles inland from Puerto Wilches on the Madelena River and about five hundred miles from Barranquilla) caused considerable apprehension lest it really be an outbreak of yellow fever. In order that an authoritative diagnosis may be made, Dr. Joseph H. White, of the International Health Board, recently proceeded to Bucaramanga in company with Dr. O. L. Pothier, of New Orleans, La., and Dr. Wenceslao Pareja, of Guayaquil, Ecudaor. The party met at Cristobal Colon whence it voyaged to Puerto Colombia. The remainder of the journey was made by train to Barranquilla, thence to Puerto Wilches by river boat and to Bucaramanga on horses. The expedition carried with it an adequate supply of sera and apparatus for the making of the laboratory diagnosis of yellow fever, icterohemorrhagic fever, and malaria. On May 24th an authoritative diagnosis of yellow fever was received and the chief quarantine officer, Dr. W. C. Rucker, of the United States Public Health Service, put in force the quarantine restrictions necessary to the protection of the Canal Zone. It is rumored that the disease exists at Catuca, a town about eighty kilometres north of Bucaramanga, near the Venezuelan border. For the present the origin of the epidemic must be regarded as a mystery but it is expected that the report of the White commission will definitely settle the matter.

SANITARY INSPECTION OF SEAPORTS.

At the request of the Surgeon General of the United States Public Health Service, Dr. W. C. Rucker, the Chief Quarantine Officer, was detailed by the Governor of the Panama Canal to make an inspection of certain ports in Honduras, Guatemala and British Honduras. Dr. Rucker departed May 3rd and returned May 20th after having made sanitary inspections at Tela and Puerto Cortes, Honduras, Barrios, Guatemala and Belize, British Honduras.

Book Reviews

HELIOTHERAPY

Heliotherapy. By A. Rollier, M.D. London: Henry Frowde and Hodder & Stoughton, 1923.

The appearance of an authoritative work on heliotherapy will be welcomed by physicians who seek to marshal all the resources of medical science in their fight against disease. This book by Rollier is an exposition of the methods of treatment which have given such remarkable results in his hands in the treatment of surgical tuberculosis. It represents the fruits of twenty years' experience at his institutions at Leysin. The interesting section dealing with the scientific basis of heliotherapy is written by Dr. Rosselet, a physicist and physician. Special chapters are devoted to the radiographic control of the treatment and to radiotherapy. Although the exact technic described cannot be applied in all climates without modification, the general principles which are so clearly delineated will serve as an adequate guide to treatment everywhere. The importance of careful dosage of sunlight, as well as of individualization, are emphasized. His method consists in exposing first the feet and then the legs and then the arms before exposing the trunk and thorax, beginning with ten to fifteen minutes three times a day. Gradually the time and amount of exposure is increased until the patient graduates to the full sun bath.

The book is illustrated with many case histories. These would be more valuable if they were fewer in number and reported in greater detail. Of 2,167 cases treated during the past eight years, 1,746 are reported as healed. A careful perusal of this publication will be of profit as well as of great interest to every physician.

ROENTGENOTHERAPY IN INTERNAL DISEASES.

Die Röntgenbehandlung innerer Krankheiten. Bearbeitet von Prof. Dr. Bacmeister, Prof. Dr. P. Cermak, Privatdozent Dr. F. M. Groedel, Dr. Lossen, Dr. F. Herzog, Dr. H. Holfelder, Dr. H. Langer, Dr. E. A. Mai, Prof. Dr. P. Morawitz, Dr. Chr. Müller, Prof. Dr. G. A. Rost, Dr. Ph. Keller, Dr. F. Salzmann, Prof. Dr. W. Stepp, Dr. O. Strauss, Dr. Fr. Voltz, und E. Pfeiffer. Herausgegeben von Fritz Salzmann. Mit 55 Textabbildungen. München: J. F. Lehmann's Verlag, 1923, p. 380.

The advance in the treatment of internal diseases with x rays is now great enough to include the unusual amount of material and reports on the subject scattered throughout the literature in one book, so as to obviate a search for this material in the various publications. This book presents the physical and biological fundamental principles of röntgenotherapy as now known in a concise and critical manner. It is intended to aid the physician and student in acquiring a working knowledge of this branch of medicine. The internal therapeutic measures, as well as the indications for surgical intervention, are also discussed in connection with röntgenotherapy. The various subjects are treated by specialists in their respective branches. The chapter on the legal responsibilities of the röntgenologist are discussed by an attorney at law.

After discussing the physical and biological fundamental principles of röntgenotherapy, the röntgenotherapeutic treatment of the following diseases is discussed: pulmonary tuberculosis, glandular and peritoneal tuberculosis, tuberculosis of the supporting tissue, nontuberculous diseases of the bones and joints, bronchial asthma, diseases of the heart and bloodvessels, Basedow's disease, hypophyseal tumors, diseases of the thymus and of the pancreas, endocrine disturbances of the ovary, the irradiation treatment of malignant tumors, and diseases of the blood and nervous system. Special chapters deal with the measuring doses of x rays, the selection of the field of irradiation and röntgen injuries.

TUBERCULOSIS.

Environment and Resistance in Tuberculosis. By Allen K. Krause, A.M., M.D. Baltimore, Md.: Williams & Wilkins Co., 1923.

Rest and Other Things. By Allen K. Krause, A.M., M.D. Baltimore, Md.: Williams & Wilkins Co., 1923.

These two small volumes by Dr. Krause are collections of papers that have been previously published in various journals. Some of the articles have been amplified. The essays cover a number of topics that are of general interest in connection with tuberculosis. Some of the subjects discussed are rest, sputum infection in childhood, adult tuberculosis from childhood infection and its prevention, some problems of medical education in tuberculosis, environment and resistance.

It was a happy thought to assemble these essays into small convenient volumes that would make them easily accessible to the educated public, both lay and professional. The combination of a charming, readable style with scientific accuracy is sufficiently unusual to warrant special mention.

The books will be read not alone with the respect that Dr. Krause's position as a leading authority on tuberculosis naturally commands, but with the keen interest that his fluent and effective presentation will arouse.

THE HEART

A Key to the Electrocardiogram. By Louis Faugères Bishop, M.A., M.D., Sc.D., F.A.C.P. New York: William Wood Company, 1923.

This booklet aspires to present in simple form the rudiments of electrocardiography. The author endeavors to disarm possible criticism by recalling that Huxley said that he had frequently been accused of a lack of technical knowledge of his subject when he had attempted to present it in very simple terms. But Huxley, aside from being a master of style, gave constant evidence even in his addresses to lay audiences of "that enthusiasm for truth, that fanaticism of veracity," of which he spoke in his Aberdeen lecture. Dr. Bishop, at times, sacrifices accuracy in his attempt to present his subject in an elementary manner—indeed, he frankly says, "Any attempting to study the subject beginning with the complete study of physiology is doomed to failure with the average man." The statement that "many hundreds of patients are relieved every year through the knowledge of their condition which is obtained by means of the electrocardiograph" will be questioned by most competent internists. The assertion that "it has made many *previously* fatal disorders of the heart perfectly clear" is certainly untrue in its implications.

There is little point in enumerating the many inaccuracies and half truths in the text. The statement that the R wave represents the isometric contraction of the ventricles, and the T wave the isotonic contraction, will not find general acceptance, any more than that extrasystoles are most often found in cases of long standing myocarditis and should be considered as indications of underlying cardiac damage. The chapter on alternation is particularly unsatisfactory. Dr. Bishop holds alternation to be of little importance, apparently because it cannot be diagnosed electrocardiographically. Aborization block and bundle branch block are confused and several figures supposedly illustrative of bundle branch block, e. g., Fig. 30, give no evidence of this lesion. The book is well printed and bound.

TOBACCO

Tobacco and Mental Efficiency. By M. V. O'Shea. New York: The Macmillan Company, 1923.

The book reviews a mass of testimony upon a question which at the end must of necessity be left open. It is not for that reason without interest and value. The writer has utilized the material gathered from literature and from living subjects. He has brought to light certain facts in the effect of tobacco upon intellectual effort. These results are, however, so uncertain and the given testimony is of so contradictory a nature that little is gained in that direction. The writer has given due reference to the many intervening factors which make the testimony vary thus. Those he has mentioned lie, however, almost entirely in the domain of easily recognized differences of sentiment. They go part way in making of the book an even more valuable treatise on psychology than on the nature and extent of the effect of tobacco. Were these factors pursued below the surface, where wish tendencies and the complexes they build influence both opinion and effect of usage as regards tobacco, still more would be known of unconscious psychology. It is a question whether more than a few salient facts in regard to the properties of tobacco would remain as important factors upon that side of the situation.

THE PROPER ADMINISTRATION OF ANESTHETICS

Practical Anesthetics for the Student and General Practitioner. By Charles F. Hadfield, M.B.E., M.A., M.D. Camb. New York: William Wood & Co., 1923.

In presenting this interesting work on anesthetics the author makes no claim to originality, but aims to present the subject to the medical and dental student in such a manner as to give him sufficient practical and theoretical information to enable him to administer anesthetics for all usual operations in surgery and dentistry. The fact that the administration of anesthetics depends principally on practice rather than on theory, is justly emphasized. Nevertheless, the author has gone quite carefully into a detailed study of the main principles involved in a proper understanding of the subject of anesthetics, without at the same time diminishing the practical character of the work.

The reader of this little volume will be impressed with the aim of the author to concentrate upon the small details that are so important in the proper administration of anesthetics. It is in the carrying out of these details that success lies, in this field perhaps more than in any other. The American reader will find himself face to face with English trade names for masks and anesthetizing apparatus of various kinds, but he will find sufficient merit in the written text to obviate any discomfort on the score of unfamiliarity with these names. The volume is one that can be read with profit by every student who hopes to administer anesthetics some day, as well as by the practitioner who realizes the desirability of refreshing his knowledge of the subject.

WHAT TO EAT AND WHY

What to Eat in Health and Disease. By Benjamin Harrow, Ph.D. New York: E. P. Dutton & Co., 1923.

The author has succeeded in producing a work that safely can be used as a guide for those who want to know what to eat and why. He has incorporated in his work the more important facts which have become established and theories which have been advanced within recent years. Being nontechnical both in character and in style, the laity can readily adopt its teachings, if so inclined.

The book is remarkably free from fads and hobbies, and seems to the reviewer to present the subject of food in a healthy, safe and sane fashion, something which cannot be said of most books of a similar kind. The author advocates a balanced ration, does not decry the use of meat, advocates the use of more milk and less meat, and generally presents a food platform upon which any rational human being can stand and still look with pleasurable anticipation towards meal time.

SURGERY.

Kurzfiefasste Chirurgische Operationslehre (Operationskurs) für Studierende und Arzte. Von Dr. Ad. Oberst und Dr. H. F. O. Haberland. Zweite gänzlich umgearbeitete Auflage mit 254 zum Teil farbigen Abbildungen. Berlin: Verlag von S. Karger, 1922. Pp. vii-228.

This book is intended as a guide to an operative course on the cadaver. It emphasizes the proper handling of instruments, the various incisions of the soft parts and bones and some of the important practical operations. The student must, naturally, have a sufficient knowledge of the topographical anatomy and be able to recognize the indications for any type of operation. The book does not cover the entire field of general surgery, as it discusses only the following procedures: the incision and suturing of tissues, hemostasis, ligations of arteries in the different parts of the body, vascular surgery, amputations and disarticulations, resections of joints, operations on the head and face, the neck, thorax and trunk, the abdominal cavity and the urogenital system. On the whole, this book is incomplete, as it does not contain any of the more recent surgical developments: it includes much that is old and little that is new and, therefore adds nothing to the vast literature on the subject already published.

WEIL'S DISEASE

Ueber die pathologische Anatomie der Spirochaetosis Ictero-Haemorrhagica Inada (Weilsche Krankheit). Von Prof. Dr. Renjiro Kaneko, a. o. Prof. der I. med. Klinik der Kyushu Imperial-Universität zu Fukuoka. Mit sechs mehrfarbigen und zwei einfarbigen Tafeln. Wien, Leipzig, München: Rikola Verlag, 1922. Pp. 181.

The discovery of the Spirochæte icterohæmorrhagiæ as the excitant of Weil's disease led to the further study of its cause, pathology, pathological anatomy, symptomatology, therapy, etc. Since this study great advances have been made, particularly in the pathological anatomy of this disease. The author's work on Weil's disease in Japan is now published in German to make this knowledge available to the rest of the world. It includes a short historical review of the literature up to the time of the discovery of the true etiological factor, the author's own investigations and his pathologicoanatomical findings in the various tissues and organs of the body, and a critical review of the literature which has appeared since the discovery of the true cause of Weil's disease and of that which has appeared since the author's first report on the pathological anatomy. A number of histories, with necropsy and microscopic findings, are also included. An extensive bibliography is appended. Most of the work was done during the period of the World War.

A GUIDE TO THE PROPER USE OF DRUGS

Arzneitherapie des praktischen Arztes. Ein klinischer Leitfaden. Von Prof. Dr. med. C. Bachem in Bonn. Dritte vermehrte und verbesserte Auflage. Berlin und Wien: Urban und Schwarzenberg, 1923. Pp. viii, 288.

This book was written for the purpose of being neither a textbook on materia medica nor a pocket handbook of prescriptions, but rather as a guide for the practising physician in the proper use of drugs and other remedies. It contains hundreds of sample prescriptions instead of theoretical discussions on the action of therapeutic measures. In response to a demand by many physicians for a treatise on the newer proprietary preparations, a number of these have been included. The volume also contains descriptions and uses of the various artificial foods, the treatment of the different intoxications and poisonings, remedies for the various parasites and for special diseases, dose tables, the contents of various drugs sold in packages (proprietaries), tables of the most important baths and springs and a therapeutic register.

ST. DUNSTAN'S

War Blindness at St. Dunstan's. By Sir Arnold Lawson, K.B.E., M.D., F.R.C.S., L.R.C.P. London: Henry Frowde and Hodder & Stoughton, 1922. Pp. vii, 148.

In this little war book the author presents the work done at St. Dunstan's as a technical record of blindness among the British armies during the World War. A great many histories of cases are cited and even though the cases were not completely worked up anamnesically and pathologically, owing to the stress of the times, nevertheless certain lessons and conclusions can be drawn from them. An analytical record of wounds or diseases that resulted in loss of vision in 825 cases is presented. The cases are grouped as traumatic and nontraumatic. The former include those due to through and through penetrating wounds of the orbits, fractures of the skull, concussion blindness without direct wound or penetration of the globe, and miscellaneous cases. The latter group were classified as those caused by inflammatory diseases of the eye (interstitial keratitis and other inflammations) and optic nerve blindness, including primary optic nerve degeneration and secondary optic nerve degeneration following swelling, detachment of the retina other than those of traumatic origin and miscellaneous cases (mostly groups of disease blindness). Disability pensions and the reeducation of the blinded soldier are discussed extensively.

PSYCHOLOGY OF CRIME

The Psychology of the Criminal. By M. Hamblin Smith, M.A., M.D. London, New York: Robert M. McBride and Company, 1923.

Smith speaks with the authority of experience and with an ability to view sanely and soundly the application of the individual psychology of the day to pressing criminological problems. Out of justice to him the word criminological is out of place in commenting upon his book since he avoids terms which encourage the formalized attitudes which have confused and concealed the actual problems in the lives of delinquents. To him these individuals are so much like all other people that in order to explain the special difficulties which their conduct brings to them and to society actual individual research is needed into the determinism of their lives. Here he finds psychoanalysis of invaluable assistance. He gives due consideration to the methods of a psychology of consciousness, especially that developed in mental tests. These, as he shows, if wisely used, precede the deeper investigation. For only in a knowledge of the unconscious of the delinquent such as psychoanalysis gives can his conduct be understood and his adaptation to society be put on its proper basis. The act for which he is accounted delinquent is but a small part of the personality to be discovered and dealt with according to the hidden determinants found. The book is a presentation of the simple but far reaching facts which such psychology reveals are to be considered in the interests of intelligent and constructive work upon delinquency.

PSYCHOLOGY OF RELIGION IN FICTION.

Peradventure or the Silence of God. By Robert Keable. G. P. Putnam's Sons, New York and London, 1923.

In this latest novel Keable brings his hero to a rending of the veil behind which humanity is fearful of peering. Paul Kestern is made of the stuff that permits no stopping until reality stands forth in clear outlines. When he held the tenets of orthodox faith he adhered to them with a stubborn intensity that augured the sharpness of the conflict by which he was to throw them aside. The phases of doubt through which he passes, the attempts he makes to grasp at some different form of the same thing until he strides forth beyond it, all have a special interest. They reveal the character of the emotional life which either clings tenaciously to that which it already possesses, or in its own defense breaks completely with it. The psychosexual phases through which this youth wins his independence are emphasized here chiefly in the strong attachment to his own sex. There is the glowing heat of his love to God, the reverential loyalty to his own father. There is also the temporary submission to the sway of the too gentle Catholic priest, the unsuccessful attempt to yield to the actual presence of Christ in the Sacrament. Something within himself which he cannot explain saves him from the hidden eroticism particularly of the two latter attachments. Then at last it is the woman who lives in clearminded relation to reality who saves him to a realization of himself, strong, independent. Keable has a power in his writing of driving the mists from the reality both of body and of mind, allowing both to stand forth in their own native strength.

Medicoliterary Notes.

The December, 1922, issue of the *Albany Medical Annals* is a memorial number to Dr. Jesse Montgomery Mosher, whose sudden death last December came as a great loss and shock to the medical profession. The frontispiece of the journal is a portrait of Dr. Mosher and the leading article a biographical sketch of Henry Hun.

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Girth Control is a June publication of Harper Brothers. The author is Henry T. Finck, who explains how surplus avoirdupois may be reduced without too much selfdenial at the dining table.

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The Labrador Unit of the College of Physicians and Surgeons of Columbia University has recently issued a small pamphlet describing the work of the unit's Grenfell Missions at Spotted Islands during the summer of 1922. A special feature is made of child welfare work, with the chief object of increasing the child's resistance to disease, and so lessening the danger of infection. Nutrition classes have been established, lectures are given and literature distributed, and two traveling health units with a doctor and nutrition worker for each, and a dentist in one, are in operation to give illustrated health lectures, examine the children, and make individual recommendations.

* * *

Mary Austin has in the June issue of the *Bookman* an article of unusual interest on Sex in American Literature. One of the chief points made is that the American public has always been and still is remarkably unsophisticated in its sex perceptions, a fact to be traced probably to the influence of Puritanism; and that the recent superfluity of writing and discussion on sex is partly caused by the introduction into our literary life of points of view on this subject contributed by some of our recently acquired members and descendants of European nationalities and races, whose experiences and points of view are quite different from ours along these lines, and, being such, have become objects of interest and speculation to our own young writers and thinkers.

* * *

Announcement has recently been made in this country that the degree of Doctor of Medicine and Surgery has been granted to Signorita Andreina Gatti-Casazza, niece of Signor Gatti-Casazza, general manager of the Metropolitan Opera House, by the Royal University of Pavia. It is considered in Italy one of the greatest of honors to receive a degree from this institution, which is almost six centuries old.

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The Children's Bureau has recently published a report of conditions in the beet fields of Michigan and Colorado, especially in regard to child labor, which is an indictment of the terrible situation in both States. In Michigan, four fifths of the children are under fourteen, and one fourth under ten. One mother casually stated that her little boy had worked in the fields "ever since he could lift a beet." During the thinning process, children often work from nine to fourteen hours a day. The beet laborers' families live in the beet shacks, which are mere makeshifts for shelter and desperately overcrowded, for five or six months out of each year. Conditions in Colorado are described as practically the same.

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A June publication announced by Appleton is entitled *Life and Confessions of a Psychologist;* the author is G. Stanley Hall, and the book is in the nature of an autobiography, including material on the history and development of psychological science during the writer's lifetime.

* * *

A recent bulletin of the Metropolitan Life Insurance Company states that during 1922 the case fatality rate of smallpox, or the number of deaths in one hundred cases, was five times the figure for 1921. Among 9,936 cases reported in 276 cities in the United States and Canada, 495 deaths occurred, or five per cent. of the total cases. In 1921 only one per cent. of the 31,489 cases were fatal. "The decline in the number of cases," says the report, "may be only a casual circumstance. The lesson to be drawn from the records of the year is that smallpox in a virulent, death dealing form has entrenched itself in recent years among American and Canadian populations. . . . The wide acceptance of the false teachings of the antivaccinationists and the indifference of the American population to the continued and vehement warnings of its public health officials have prepared tinder for what may well become a catastrophe of the first order. . . . The press and every other facility for teaching the lesson . . . should support the effort of Federal, State and local officials to protect America from a threatened danger."

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The University of Chicago Press has just published *The Hobo,* by Nels Anderson, in which the problems of vagrancy are reviewed and discussed in a very readable yet serious manner. An interesting chapter is on hobo songs and ballads.

* * *

The Department of Commerce has announced that provisional birth figures compiled by the Census Bureau for the first six months of 1922 indicate lower birth rates than for the corresponding months in 1921. In the latter year, the rate was 24.8; in 1922 it was 22.7. North Carolina shows the highest, and Vermont the lowest rate. Death rates compiled for the same periods are higher in 1922—12.6 against 12 in 1921.

Practical Therapeutics

X RAY AND COMBINED TREATMENT OF ACNE VULGARIS.

By Joseph Jordan Eller, M.D.,

New York,

Attending Dermatologist, French Hospital; Clinical Assistant, Department of Dermatology and Syphilology, Vanderbilt Clinic, Columbia University.

Permanent care of acne vulgaris is as a rule difficult, inasmuch as recurrences are caused by various factors. The disease must be attacked from different angles and it often taxes the mind of the trained dermatologist to get the desired result. In order to understand the reasons for a combination of treatments, I shall present a brief review of this disease.

Acne is a chronic inflammatory disease of the oil glands, usually of the face, but also of the chest and upper part of the back—characterized by comedones, papules, nodules, pustules, or a combination of any or all of these, and frequently is seen between the ages of twelve and thirty.

The face is the usual site attacked and the severity varies. In some cases only comedones and an oily skin are present; others have papules or indurated pustules; and it may be so severe as to be complicated by small furuncles. The disease most often begins slowly and gradually grows worse, that is, of a more severe type. The acne patients usually have a greasy and relaxed skin and often have associated an oily seborrhea of the scalp as well as of the face. In these cases, the gland outlets are large and comedones are more numerous. Acne, as a rule, lasts for several years and often leaves small pitted scars according to the tendency of the patient's skin to scar formation, which varies in different persons. The socalled clinical varieties of acne are named from the predominant type of lesion present, such as acne papulosa, acne pustulosa, acna indurata, and acne atrophica, according to whether papules, pustules, indurated inflammatory hard papules and pustules, or atrophic pitted scars are present. Most of the lesions, if not all, have their beginning in a blocking up of the gland outlet, but this is not demonstrable in all, especially the deepseated lesions.

ETIOLOGY.

The disease is a common one, and attacks both sexes about equally, usually starting about the time of puberty and often persistently recurring up to the age of thirty, if untreated. Unna, Gilchrist, and Sabouraud described a bacillus called the acne bacillus as being the causative factor in acne vulgaris. Strickler, Kolmer, and Schamberg have not confirmed this finding in their investigations. The evidence today leans towards acne being a germ disease only secondarily. The primary causes are those which bring the skin into a receptive condition for the parasitic invasion, without which the bacteria which are on the skin normally would not become pathogenic. Any one of the following conditions, alone or in combination, contributes to the primary cause of acne: constipation, intestinal fermentation, lack of exercise, circulatory weakness, chlorosis, endocrine dysfunction, menstrual disturbances, systemic intolerance to sugars and starches, and, externally, anything which has a tendency to block the gland openings, although this plays the smallest rôle. Acne is often worse about the time of the menstrual periods. Other patients have a new or a worse outbreak of acne lesions after indulging in sweets or excessive starches.

PATHOLOGY.

Acne is essentially an inflammation of the sebaceous glands with hypertrophy. This is concomitant with a hypersecretion of the glands and a resultant excessive pouring out of oil on the skin, giving the greasy complexion which these patients as a rule have. Secondarily, these glands become infected with the staphylococcus albus and the socalled acne bacillus, causing a more marked inflammatory zone about the glands; in other cases causing small dermic abscesses; and in some, small furuncles, according to the severity of the disease. The greatly enlarged oil gland, the opening of which is plugged by a comedone, causing the gland to become filled with sebum and cell detritus, with an inflammatory zone about the gland, is the characteristic picture of acne.

PROGNOSIS.

Acne recurs at times after the most rigid treatment, if the underlying causes still persist after the patient is cured locally. The patient must work closely with the doctor in following all directions, both before and after cure. If acne is untreated, pitted scars often result, and the disease may last from ten to fifteen years. If treated properly, a permanent cure may be effected in from two to six months, according to the severity and to the general condition of the patient.

TREATMENT.

Both systemic and local treatment are necessary.

Local treatment.—The skin is to be washed thoroughly with a mild soap once or twice daily. No cold creams or greasy creams are to be used, for they aggravate the condition by supplying grease or oil where there already is too much. Only pure unadulterated powders may be used, such as pulverized rice. The patient is instructed to rub a sulphur lotion gently on the acne areas and to apply a coat of the lotion which dries like calcimine. This lotion differs from the white lotion of sulphur in the United States *Pharmacopœia* by being about five times the strength, making it as thick as a thick cream, instead of a milk consistency, which latter is almost useless in acne. The following is the formula for the heavy lotion:

Zinc sulphate	ounces 2
Potassium sulphuret	ounces 1½
Glycerine	drams 1
Rose water	drams 1

While this is being used the x rays are given in fractional doses. The action of the x rays is to contract the greatly enlarged oil glands back to normal size. The sulphur lotion can be used with perfect safety with the x rays when the latter are given in the doses to be described. The acne areas are x rayed weekly with one quarter of an unfiltered skin unit, according to the MacKee standard, for ten doses. If the acne is completely gone, the x ray treatment is stopped, and the patient is told to keep on with the lotion for about eight weeks longer. If the acne is still active, the lotion is continued and the x rays are given through a quarter of a millimetre of aluminium in doses which are equivalent to one eighth of an erythema dose for about six more treatments. If the acne still persists, the x ray treatment is discontinued and other treatment is instituted which will be described later. Most cases of acne are cured permanently with about twelve x ray treatments when combined with the heavy white lotion, plus the systemic therapy. The writer has found in his experience that much more x ray treatment is necessary when acne is treated without the lotion described. No bad effects have been observed in the use of this combination in a large number of cases, so that it is preferable to use it to shorten the course of treatment.

The x rays are given in the following manner: The patient is put in a recumbent position on a table and the eyes, scalp, and neck are covered by lead foil or lead rubber for protection from the x rays. Then one quarter of a skin unit, unfiltered, is given, with the centre of the target directed at right angles to the zygoma, first on one side and then on the other side of the face. In addition, it is preferable, although not always necessary, to give one eighth of a skin unit, unfiltered, with the anode directly over the nose (full face). For this latter dose, the plane of the face should be at right angles to the perpendicular for the lateral exposures. The back and chest, if involved, should receive one quarter of a skin unit, unfiltered, to each half, care being taken to shield the face and scalp from exposure. Occasionally it is necessary to give separate exposures to the external surfaces of the arms. The factors for the unfiltered one quarter unit of x rays are ma. 3; sp. g. 6; t. 30 sec.; d. 8 inches. This dose is equivalent to slightly less than one quarter of an erythema dose, and when given weekly, twelve to fifteen such exposures are easily tolerated. The factors for the filtered treatments, which are usually started after the tenth unfiltered exposure, are ma. 3; sp. g. 6; time 42 seconds; distance 8 inches; filter, one quarter of a millimetre of aluminium. This is equivalent to slightly less than one eighth of an erythema exposure, and four to six such doses can be given quite safely.

All comedones are expressed. At times the sulphur lotion causes a mild irritation of the skin. The patient is then instructed to stop the lotion and to use instead a greaseless cream, such as the vanishing creams on the market, until the skin inflammation subsides. The object should be to effect a complete and permanent cure with as little x ray treatment as is possible, and after a course of treatment consisting of three to four skin units given fractionally in one quarter skin unit doses, the course should not be repeated for at least a year.

Constitutional treatment.—The patient is instructed to leave sugars and starches out of the diet as much as possible. A list is given the patient on which the restricted foods are written, among which are butter, nuts, cheese, ice cream, soda, syrups, beets, bananas, oatmeal, and potatoes. Some patients lose too much weight on this, and in these the diet restriction must be lightened. For constipation, cascara sagrada or a rhubarb and soda mixture, with or without tincture of gentian, is given in the necessary doses. The diet is corrected to avoid fermentation. Anything that might help the patient's general condition is suggested. If there is an endocrine dysfunction, this must be corrected. The menstrual function and genitourinary tract should receive attention. A good formula for the treatment of the oily seborrhea or dandruff of the scalp, which usually is found in the acne patient, is the following:

Euresol	drams 1½
Bichloride of mercury	grains 3
Salicylic acid	drams ½
Glycerine	drams 2
Oil of bay	minims 3
Spirits vini rectif. (70%) q. s. a. d.	ounces 8

This lotion is to be rubbed on the scalp once daily.

In patients where recurrences have occurred in spite of all the treatments and where they have followed all the directions, a combined stock vaccine consisting of the acne bacillus, colon bacillus, and the staphylococcus albus was given in one quarter billion doses every four days, increasing the dose to one billion of each bacterium until forty to fifty doses were given. The cases which have recurred following x ray, lotion treatment, with systemic treatment, comprised about ten per cent., and a large percentage of these relapse cases were permanently cured by giving the vaccine by the method described above. It was found that the vaccine had no effect until a large number of treatments (about forty) were given, and that the only reason for failure here was in the vaccine being given improperly or in too small a number of doses. It should never be given at intervals of less than four to six days and it should not be increased more rapidly than half a million of each bacterium at a time. If the dose is too large, or if the injections are given too frequently, more harm than good may result. A large number of cases of acne are under treatment with the use of the vaccine alone, and the results will be reported later.

Acne often leaves pitted scars which mar the appearance of the skin, and these pitted scars are especially annoying to women. A skin thus scarred may be improved by means of the Kromayer light administered with pressure, the same method being used as in the treatment of port wine marks. The light which is watercooled is placed against the scarred skin and the patient presses it against the affected part. Full power is used (fourth button of rheostat) and the water is allowed to circulate through. The time varies from three to six minutes and a reaction occurs which blisters and peels the skin. With this treatment the scars are less evident and the skin over these areas looks much smoother. Several such exposures may be necessary in a severely scarred case.

Since MacKee's technic was introduced in this country, acne can be treated with the x ray safely, and since we have this agent, the time of cure has been lessened from one to two years to a few months. In conclusion, acne must be treated in great detail from every point of view if a permanent cure is to be expected.

24 WEST FIFTY-NINTH STREET.

Proceedings of Societies

CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS

Twelfth Triennial Session, Held in Washington, D. C., May 2, 1922.

Dr. Frank Billings, of Chicago, in the Chair.

The Trend of the Practice of Modern Medicine.—Dr. Frank Billings, of Chicago, in his presidential address said that since the close of the war the mind of the whole world had been occupied with reconstructional ideas on politics, education, industry, and all other human activities. Modern medicine, among other activities, had been greatly influenced by postwar ideas. Gradually, during fifty years of evolution, the practice of medicine had been broadened by the development of chemistry, physiology, pathology, bacteriology, and sanitation, till it had advanced to the stage of an applied science. Medicine, however, would always remain essentially an art, measurable by the technical skill and experience of the physician. The older anatomical conception of disease had given way to the study of functional disorder, that is, the greater emphasis was now placed on pathological physiology.

While specialization had developed considerably before the war, it had been enormously fostered by war conditions. Training camps had been supplied with good diagnostic and hospital facilities and the necessary equipment and personnel, backed by military discipline. The result was that many general practitioners became specialists during the war. This had created a condition of ultrascientific medicine and the development of overspecialization. Group practice and the group clinic had become more and more in evidence.

To estimate the practical value of this group system, it should be asked how many patients really required the benefits of an application of precise methods of diagnosis, as represented by the group clinic and its laboratory, and how many required hospital care. From long hospital and clinical experience, Dr. Billings said that a correct anatomical and functional diagnosis could be made in from eighty to eighty-five per cent. of all patients of an average community by a qualified, industrious, painstaking, general practitioner, by the sole application of the trained mind, the special senses, the hands, and a simple laboratory equipment. Also, eighty per cent. of patients would receive efficient care as ambulatory or house patients. The minority of patients required attention in the specially equipped hospital.

It was unfortunate that derogatory effect on the public and the medical profession had been created by a too great multiplication of clinical laboratories. The special laboratory diagnoses were costly, were often used unnecessarily, and too frequently were made to take the place of a primary, fundamental, physical examination. Equipment for the simpler laboratory tests should be in the physician's office.

In regard to medical education, the standard of training of the medical student in the United States was one justly demanding praise, but it was to be remembered that the teachers were usually specialists, and were apt to emphasize details of a given specialty, rather than to provide training in the broad general principles of pathology, medicine, surgery, and obstetrics. The constituent associations of this congress had a membership which included the foremost medical teachers, research workers, and specialists in the clinical and preclinical branches of medicine, and was therefore fitted to assume the responsibility of leadership in a solution of problems dealing with medical practice and the health and welfare of the public. The influence of the congress should be directed toward efforts to secure a curriculum, having as its purpose the proper education of the general practitioner. This would correct the unfortunate tendency to overspecialization, which had tempted many men who were insufficiently qualified to take up special lines of work. The correction of this would lie in the development of opportunities in various parts of the country for adequate postgraduate training in the several specialties of medicine and surgery.

While no one could appreciate more than he the value of modern medical facilities to the practice of modern medicine his endeavor had been to point out erroneous tendencies which were derogatory to the profession and unjust to the public. It was believed that the past history of the medical profession, characterized by high motives, selfsacrifice and productive service, would enable it voluntarily to correct existing conditions, detrimental alike to medicine and to society.

Factors Which Enter Into an Adequate Diet.—Dr. E. V. McCollom, of Baltimore, discussed the viewpoint of investigators in the field of nutrition, especially in regard to their interpretation of the failures and successes of experimental work. Fifteen years ago it was believed that chemical analysis gave reliable information as to the physiological values of food, that is, if one knew what the diet should contain in the way of proteins, fats, carbohydrates, and mineral salts, a diet could be planned to insure complete physical wellbeing. A number of facts, however, forecast by chemical investigation, had arisen as the result of study. Thus it was found that there was a great variety in the quality of proteins from different sources. There were poor, medium, good and excellent proteins in natural food stuffs, also some of those which were poor when serving as a sole source of nutrition, served greatly to enhance the value of other proteins in the dietary. For instance; proteins of cereal grains, tubers and fleshy roots had no high nutritional value, but became valuable if taken in combination with those of animal tissues.

Another fact well established in the past twelve years was the existence of certain substances, called collectively vitamines, and designated vitamines A, B, C, and possibly a fourth, if verified by further experimental work. The importance of these factors was shown by the fact that there was a specific disease which attended the lack of each specific vitamine. The ophthalmias of dietary origin arose from loss of vitamine A in the dietary. This vitamine was by no means distributed in the natural food stuffs in sufficient abundance to meet physiological requirements of men and animals. Deficiency of vitamine B caused in animals a polyneuritis of dietary origin and in humans beriberi. Scurvy was due to the lack of a specific substance, vitamine C. This latter was the most easily destroyed of the essential food components. There was also a group of nonspecific diseases, in which no single dietary factor could be held responsible, and of these the most prominent and most studied was rickets. Pellagra was also a disease due to nutritional deficiency. In regard to general nutritional studies, a diet selected from cereal grains, legumes, fleshy roots, and muscle cuts of meat (no matter how varied or palatable) would never support adequate nutrition in man or animals. This had been substantiated by experimental data.

There were only three types of diet which had ever succeeded in the nutrition of men and animals; first, a strictly carnivorous diet in which all parts of the animal (muscle, fat, viscera, and bony substances) were eaten; second, the oriental diet, in which a large quantity of leafy vegetables were consumed (unknown in the American dietary); third, a mixed diet, typical more or less of the American dietary. The latter, however, was often seen to contain too large a proportion of food derived from highly milled cereals (rice, white bread, etc.) in addition to muscle cuts of meat, potatoes, sugar, etc. This diet often gave rise to a large number of cases of skeletal defects among children; from twenty to thirty per cent. of school children were underweight for their age. The large prevalence of dental caries was due to lack of elements necessary to the teeth when forming, and, dietary reform was the only means by which better dentition would be obtained.

Experimental Evidence of the Lack of Vitamine B in Nutrition.—Lafayette B. Mendel, of Yale University, said that in the investigations on vitamine B the opportunity to employ animals without the limitations of research on man, had been an important factor. Experimental polyneuritis opened the way for the interpretation of beriberi as an avitaminosis.

Hopkins in 1906 prophesied that the health and nutrition of individuals depended on unsuspected dietary factors. At the present time, thanks to the experimental studies conducted in a number of laboratories, several of these factors had been discovered; although their chemical nature had not yet been identified, the evidence for their need was beyond question. Vitamine B was distributed widely in plants and animals.

When a diet lacking in this factor but considered otherwise adequate was offered to animals, they soon declined to take sufficient food, no matter how palatable it might be. The adjuvant to the diet of this substance rapidly brought a return of appetite. This same phenomenon was observed in convalescents too long maintained on restricted diet, and manifesting an indifference to food.

Human beriberi and the experimental polyneuritis of birds had long been studied. Recently similar experiments had been carried out on the dog. This animal, if maintained for weeks on a diet lacking in vitamine B, first suffered from vomiting and gastric disturbance, and then refused to eat. Later its limbs became involved progressively in spastic paralyses. Convulsions followed and the animal finally died. If vitamine B was administered before the advanced stages, the animal recovered entirely and promptly.

Recent workers, he said, believed that lesions of the gastrointestinal tract were associated with deficiency in this vitamine; and that the functional activity of the lymphoid tissues was interfered with. Lymphopenia and marasmus accompanied withholding the vitamine B, and disappeared with its restoration. In other words, its presence was necessary to the normal functioning of lymphoid tissue. Specific lesions of the lymphoid tissues, however, might be induced by different agencies, of which vitamine deficiency was only one.

Distribution and Properties of Vitamine C.—H. C. Sherman, of Columbia University, said that the lack of a necessary antiscorbutic substance in grains, vitamine C, was established by experiments on guineapigs which were fed entirely on rice or on oats. The instability of this vitamine would make difficult its isolation in pure form, but it was measurable by its effects experimentally, and its occurrence in various food stuffs could be computed. Grain, he said, in a resting state contained little or any of this substance, but properly sprouted grain and cereals showed a marked development of vitamine C. A preexisting substance in the seed becomes transformed into vitamine C as the grain sprouted. This fact was of fundamental significance. Vitamine C was water soluble and passed in the sap into the most actively growing, succulent parts and juicy stems and tubers of plants. Oranges, lemons, tomatoes, and raw cabbage were rich sources of vitamine C.

Animals seemed to depend on plants for their needs of vitamine C. Rats, which were almost immune to scurvy, seemed to require little of it. Animals did not seem to store vitamine C to any extent in their bodies, but possibly the blood contained it, as did milk. The milk of the cow fed on fresh grass in summer was rich in this vitamine. This fact applied also to the milk of the nursing mother, who should receive an ample allowance of fruits and vegetables to supply vitamines B and C, as well as good milk rich in vitamine A. Vitamine C appeared to play a part in the nutrition of animals, even those immune to scurvy, as rats, which did not manifest scurvy, were nevertheless improved in health and vigor by its addition to their diet.

Physically and chemically, vitamine C was soluble in water and alcohol and was destroyed readily by heat or oxidation. Destruction by heat was more rapid in the presence of air. Both time of heating and temperature exerted an influence on the destruction of this vitamine. Thus, the lowest time and temperature of heating must be used to conserve this vitamine in the preservation of antiscorbutic foods. The vitamine appeared more readily destroyed in alkaline solution than in acid. It was abundantly preserved in canned tomatoes.

Relation of Diet to Rickets.—Dr. Paul G. Shipley, of Johns Hopkins Medical School, said that in the Carolinas, in the latter half of the eighteenth century, slave owners experimented with diets affecting the health of slaves, and found that certain dietaries induced dropsy and disease of the eye. It was now known that the deficiency of vitamine A in the diet was followed by such diseases as keratomalacia, xerophthalmia, night blindness, iritis and panophthalmitis. Human beings, however, were not so likely to suffer starvation in regard to one food element, as they were to suffer deficiency.

Rickets was a deficiency disease, the effects of which were seen most in the skeleton, but it also involved the whole organism, including the nervous system. The pathology of the blood in this condition deserved careful attention. The normal calcium content of the blood was from nine to eleven milligrams to one hundred c. c. of blood; the normal phosphates from four to six milligrams to one hundred c. c. of blood. The calcium might not be reduced, the phosphate might be greatly reduced and occasionally the serum calcium was reduced while the phosphate was normal. If the serum calcium fell below five, there was tetany, either latent or manifest. To be effective a diet must restore the normal phosphate level and the normal blood calcium. Disturbance of the calcium phosphate ratio produced rickets, as normal bone growth depended upon this balance in an optimal measure. In cases of rickets with latent tetany, there was marked blood calcium reduction. Codliver oil seemed the most suitable substance to compensate for faulty calcium phosphate balance. Whether this contained a vitamine identical with vitamine A was not known. It might be different.

Another point was the influence of light in the prevention of rickets caused by deficiency diet. Sunlight, the mercury quartz vapor lamp, the cadmium arc, iron chromium arc and ultraviolet light, were all capable of curing rickets in the presence of vitamine deficiency.

Relation of Diet to Pellagra.—Dr. Joseph Goldberger, U. S. Public Health Service, reviewed the more outstanding significant evidence bearing on the relation of diet to pellagra including the essential dietary factor on which the relationship depended. In studying diets known to have been connected with pellagra and comparing them with those of known value in curing and preventing the disease, he had been led to conclude that the etiological factor was a deficiency of protein, best determined by estimating its biological value by means of Thomas's ratings. A liberal intake of minerals and known vitamines failed to prevent the disease, so that, of the dietary essentials known at present, the protein factor alone seemed responsible in the prevention or causation of pellagra. Since protein was now regarded as a complex of aminoacids, varying in different proteins, the etiology of the disease would appear to bear definite relationship to the aminoacid makeup of the protein supply. Just what combinations of aminoacids were primarily concerned remained to be determined. The possibility of an as yet unknown factor, conceivably a vitamine alone, or in combination with the aminoacid factor, was not absolutely excluded.

Application in Practice of the Results of Vitamine Studies.—Dr. L. Emmett Holt, of New York, said that vitamine studies had given a new basis for the evaluation of foods. Many articles, valueless as regards energy, furnished an essential nutritive substance, entirely apart from their chemical constituents. Thus, tomatoes, cabbage, spinach, lettuce, chard, and green vegetables and fruits had an essential food value, although composed chiefly of cellulose, water, acids and salts. The preparation, preservation, and storage of foods, rendered necessary by conditions of modern life, sacrificed a certain amount of their nutritive value, and this was true also in regard to the overrefining of flour and grains. On the other hand, food preservation presented immense advantage. White wheat flour kept for months without deterioration, while whole wheat flour spoiled within thirty days, so that its general adoption was practically an economic impossibility. The sterilization of milk, while it might injure its vitamine properties, ensured protection from milk borne diseases, and the same principle applied to the preservation of vegetables, fruits and eggs.

Infants were likely to be injured by the sterilization of milk by heating, as through this process vitamine C was destroyed, though apparently vitamine A and B were not injured. To counteract this danger, some anticorbutic must be added to the diet of infants reared on sterilized milk. The body had a store of this vitamine which became exhausted after a time and scurvy appeared. As the winter milk of cows was deficient in vitamine content, it was well to add some substance rich in vitamines to a milk diet in winter. The diet of the nursing mother might be affected similarly, which would account for puzzling cases of scurvy developing in breast fed infants. In the Philippines beriberi often developed in the nursing children of rice fed mothers. Malnutrition among poor children was due to lack of vitamines A and C in the mother's diet.

The effects of vitamine deficiency were most clearly noted in times of war, stress, and famine, and were seen in prisons, army camps, on shipboard, and in the arctic regions also in infancy. Vitamines were so widely distributed in natural food stuffs, that unless the diet of children was very onesided, they should receive their full supply in a normal diet.

In vitamine investigation there were two important points; one their specificity, and the other the small amounts necessary to produce effect. Vitamine requirement, however, was affected by other conditions, such as confinement, exposure, hard work, and poor food. There was a growth requirement in children, while adults had a maintenance need only. Infants suffered most from deficiency, as their growth was greatest and their diet most restricted.

The specificity of vitamine was absolute. They were not interchangeable, and seemed entirely independent of each other, each serving a definite nutritional function. There was no proof that benefit could be derived from an excess of them. A practical question was whether a relative deficiency would not produce a general condition of ill health rather than outspoken disease. The only proof of this would be the therapeutic test and decided improvement resultsing from the addition to the diet of substances rich in vitamines.

In conclusion it should be said that for children plenty of milk and a varied diet were indispensable. Skimmed milk should be supplemented by butter.

When milk was excluded, green leafy vegetables should be plentifully used. Whole grain cereals and potatoes furnished water soluble vitamine. Fruits and canned tomatoes furnished antiscorbutic vitamine and cabbage was rich in all vitamines.

Dr. A. F. Hess, of New York, in discussing these papers, said that he was much interested in the work dealing with rickets. Much had been learned by experimental investigation since the rat had been used for laboratory work in this connection. Rickets was a common disorder in the temperate zone, about seventy-five per cent. of breast fed infants showing tendency to it in some form or another. It had a seasonal incidence, being highest in March and April. That might be due to absorption and not entirely to food intake. There was a reciprocal action between light and food, and a seasonal effect on blood phosphate, as shown by examination of the blood month by month. In the summer time the ratio was four to five milligrams to one hundred c. c. of blood, but in January, February, and March, it was much lower. Sunlight had a direct curative effect on rickets, but artificial sunlight was also efficient. The reciprocal action of light and food was a wonderful thing, and had broadened the conception of the pathology and treatment of rickets. Physiologists had long been cognizant of the effect of light upon plants and animals, but had neglected to apply the principle to human growing infants.

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Letters to the Editor.

TREATMENT OF ANGINA PECTORIS

PHILADELPHIA, *May* 7, 1923.

To the Editor:

Referring to the interesting and instructive symposium on the heart and bloodvessels in the current issue, let me direct special attention to the following extracts from the contribution by Sir James Barr, since it presents a substantial basis for the study of angina pectoris: "Every muscle in the body is a miniature battery and the efficient discharge of its function depends upon the integrity of the cell and its electrical charge. . . . In health these batteries work well, but in disease there are many breaks in the continuity of the series. So far as we know the presence of free calcium ions in the blood and tissues is necessary for effective muscular contraction. The calcium ions diminish the irritability of the muscle fibre, but increase the force of its contraction." My impression is that angina pectoris is due to calcium depletion, affecting not only the nerve structure responsible for cardiac innervation, but also the protoplasmic cells comprising the muscular tissues of the heart itself; and the basis for this deduction rests upon certain well known and fully recognized conditions in physiological chemistry as follows:

We are advised by physiological chemists that the proportions of calcium and magnesium in the cerebral nerve structures are as one to ten and assuming that this is true of all the nerve structures throughout the body, we can readily calculate the effect of a diminished alkalinity in the blood upon the nerve mechanism as well as upon the musculature of the heart. According to Matthews, the nerve structure is an electrically charged colloid, the colloid particles carrying the positive electrical current, while the liquid portion carries the negative electrical current, and, of course, so long as the body fluids are normal, molecular changes will continue. If a diminished alkalinity of the blood is present, a condition which I have termed acid excess, it follows that there will be calcium depletion, because calcium being a stronger base than magnesium, it will be leached out, and the effect of this is a replacement, substitution or infiltration by magnesium, because nature abhors a vacuum. Under such conditions we have an abnormal state of the nerve supply, magnesium being a nonconductor of electricity, or a poor conductor, the normal transmission of nerve impulses is hindered, arrested or destroyed. Such being the case, the attacks are characterized by great pain and, as has been well outlined by Dr. Alexander Blackhall-Morison in his contribution on The Blood Pressure in Angina Pectoris, there follows an indefinite period of low blood pressure, simply because the normal alkalinity of the blood has not been restored and there is a lack of calcium ions to produce and maintain magnesium dissociation.

Another item is worthy of consideration in this connection, as I have referred to the protoplasmic cells composing the musculature of the heart, because they are also subject to the same or similar conditions as pointed out in the case of the nervous system. For example, the nucleus of the cell has an acid reaction, while the ectoplasm is alkaline, and the physiological chemist will readily understand this peculiar condition favors and promotes interchange between the intercellular and intracellular fluids. If the intercellular fluids carry an excess of acid, this acid will penetrate the alkaline ectoplasm and affect the intracellular activity, and as a result of this disordered condition we have edema, which is merely a symptom of calcium depletion. That leads to the inference that in all cases of angina pectoris we have this fundamental condition to contend with and we can trace that condition to dietary deficiency, not necessarily to the lack of the various vitamines, but to lack of food materials which carry a surplus of calcium or lime. This statement is made with confidence and the claim is advanced that we have here a scientific basis for the administration of calcium.

Naturally, the question will arise as to the most appropriate calcium preparation and this is a matter of no little significance. From current literature I find that physicians readily take up with the administration of calcium chloride, giving it internally as well as intravenously, but my experience does not warrant its administration in this class of cases, for the simple reason that nearly all of these patients (asthmatic and heart disease cases), suffer from dyspepsia characteristic of the typical acid excess, and the administration of the chloride only adds to their misery for the reason that it increases the production of hydrochloric acid. It may be given in the form of the carbonate, provided it is submitted to thorough trituration, but the most conspicuous preparation of calcium is to be found in the colloid, which presents the inert infinitesimal particles—they neutralize acidity and utilize it.

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Abstracts from Current Literature

RÖNTGENOTHERAPY

Röntgenotherapy of Peritoneal and Genital Tuberculosis in the Female.—W. Weibel (*Wiener klinische Wochenschrift,* November 30, 1922) reports thirteen deaths in forty-one cases treated with röntgenotherapy. None of the patients died from genital tuberculosis but six died from peritoneal tuberculosis. The results were so good that the author prefers the less dangerous irradiation treatment in every case. It is not necessary to use a powerful apparatus. The author recommends röntgen ray treatment only in the adhesive form of tuberculous peritonitis. Better results were observed in general tuberculosis.

Preliminary Report on the Treatment of Pertussis by the X Ray.—Henry I. Bowditch and Ralph D. Leonard (*Boston Medical and Surgical Journal,* March 8, 1923) report the results of x ray treatment in twenty-six cases of pertussis. The patients were from three months to forty years of age and in different stages of the disease. Each patient received three or four applications of the x rays at intervals of two or three days. The doses were regulated according to the age of the patient and the total amount given any one patient was well under an erythema dose. Seventy per cent. were relieved through a more marked diminution of spasms than would be accounted for by normal convalescence. In a small percentage the spasms and whoops disappeared entirely within six days, and the patients were clinically well, except for possibly a very slight cough. Ten per cent. of failures included one case that was moribund and one rather difficult feeding case. The writers are unable to give any rational explanation of the action through which the x ray appears to produce the beneficial results, but do not believe it is due to any direct bactericidal action. No definite conclusions can yet be drawn, but this form of treatment seems to be more efficacious than any other at present known.

Studies on the Changes Produced by Röntgen Rays in Inflamed and Connective Tissue.—Alexander A. Maximow (*Journal of Experimental Medicine,* March, 1923) induced inflammation in rabbits by introducing flat, rectangular, celloidin blocks with slits, parallel to the surface, cut into the subcutaneous or intramuscular tissue of the abdominal wall. The animals were then rayed. In some instances the raying was done before the introduction of the celloidin blocks. The action of x rays on inflamed tissue manifested itself first by a considerable depression of the usual reaction on the part of the fibroblasts, which undergo a high degree of pathological hypertrophy of protoplasm and nucleus, the latter often showing amitotic constriction instead of mitosis. There is an intensive edema of the connective tissue surrounding the foreign body, and in its immediate neighborhood a thick layer of netlike clotted fibrinous exudate is formed. The leucocytes and polyblasts showed no distinctive qualitative changes. The rate and duration of all the cells coming from the blood were increased at first, and secondly there was a distinct delay in the process of the common transformations usually undergone by the polyblasts on the field of inflammation. There was swelling of the endothelial cells in the bloodvessels, with fragmentation of the nuclei. The striated muscles showed degeneration of the fibres. Maximow states that it is surprising that his results seem not to agree with the predominating views on the action of x rays on cells.

Reliability of the Röntgenological Diagnosis of Duodenal Ulcer.—Martin Haudek (*Wiener klinische Wochenschrift,* December 21, 1922) believes in the reliability of the x rays in diagnosis. He found them to fail only twice in thirty-eight cases. The most important characteristic finding is the indentation or retraction at the greater curvature immediately below the pylorus, then, in the order of their importance, come the hourglass form, and finally the elongation of the pyloric canal. The niche formation, which is so important diagnostically in gastric ulcer, is not so important in duodenal ulcer. The asymmetrical position of the pylorus is also a valuable sign. Furthermore, the lesser density of the shadow (as a result of the admixture of a great amount of duodenal secretion) and the flighty filling of the duodenum in many cases is an indication of the location of the disease.

Röntgen Diagnosis of Intracranial Affections with the Aid of Dandy's Procedure.—Artur Schüller (*Wiener klinische Wochenschrift,* August 24, 1922) states that encephalography (the röntgenography of the skull after the inflation of air by way of the lumbar sac) makes possible, 1, the confirmation of the presence, nature, and extent of a hydrocephalus; 2, the differential diagnosis between cerebral and cerebellar tumors; 3, the differentiation between a local erosion or protrusion of the skull cap which is produced by a local process (as for example a tumor of the hypophysis) or by a diffuse pressure on the brain (hydrocephalus); 4, the localization of a cerebral tumor, at least as to the site of the involvement and occasionally also in regard to the exact diagnosis of the focus, size and nature of the lesion; 5, the confirmation of a craniostenosis combined with hydrocephalus, and 6, the decision as to the possibility and nature of an operative interference.

Röntgen Diagnosis of Gastric Ulcer.—G. Jansson (*Finska Läkaresällskapets Handlingar,* July-August, 1922) emphasizes the great rôle played by radiology in ulcer diagnosis and describes the röntgenological symptoms of ulcus ventriculi. The leading symptom is the socalled ulcer niche which presupposes the crater of the ulcer to be filled with contrasting pulp, and which appears on the röntgenogram as a projecting shadow from the gastric silhouette. Its appearance varies according to whether the ulcer is penetrating or nonpenetrating and callous. The author describes the various niche types and their varying positions, reporting several of his own cases which are illustrated by plates. The indirect symptoms of ulcus ventriculi are then enumerated, the spastic as well as the organic hourglass stomach being mentioned, and also disturbances of locomotion and secretion.

Proper Doses of X Rays in Internal Medicine.—Robert Lenk (*Wiener klinische Wochenschrift,* August 17, 1922) contrasts the medical (processes applied for normal healing) with the surgical x ray technic (producing extirpation and destruction of pathological tissues). The latter technic should be avoided from the viewpoint of the internist, inasmuch as it is in absolute contrast to the principles of internal medicine. Consequently, the following demands should be met: the smallest possible but adequate dose and distributed dispensation under constant control of the subjective and objective finding. These points of view are still so new that the subject is still in its inception.

Deep Therapy.—C. C. Anderson (*British Medical Journal,* July 8, 1922) states that the method of application may be grouped under three headings: 1, röntgen irradiation alone; 2, röntgen therapy with radium irradiation, and 3, röntgen therapy with physical agents to increase the efficacy of the x rays: a, electrolysis with metallic salts, and b, packing the patient in paraffin blocks. Röntgen therapy alone avoids burning the patient, but it is too early to speak of definite results. The combined röntgen and radium therapy promises to give good results. Röntgen therapy with copper electrolysis is proving to be the most satisfactory method of approach. There is a slight danger of burning the bowel, but the results far outweigh this disadvantage and besides, the scar is loose and supple and suppuration in fungating growths is diminished; it is specially effective in malignant skin lesions that are resistant to the other forms of treatment, including radium. It is still too early to judge the results from röntgen therapy and the packing with paraffin blocks, but if it should prove to be efficient, the technic will be greatly simplified.

A carelessly focussed application of intensive rays may be stimulating to distant portions of the growth and this source of danger must be guarded against. The patient should be subjected to extensive clinical, laboratory, and radiological examinations to determine the exact location of the tumor and the fitness of the patient to undergo this form of treatment; a blood examination is most essential for this purpose. The secret of success with deep therapy lies in an intimate cooperation between the clinician, the pathologist, the physicist, and the radiologist.

RADIUM THERAPY.

The Cure of Trachoma With Radium Rays.—L. Müller and F. Högler (*Wiener klinische Wochenschrift,* December 7, 1922) report some excellent results in five cases of trachoma treated by radium. The treatment is simple and absolutely not dangerous when carried out by an experienced radiologist. It is a distinct advance over the methods used heretofore. The authors irradiate three to five times with 150 to 250 milligram-radium element hours for each dose.

Radium Therapy of Cancer.—Arthur Burrows (*British Medical Journal,* July 8, 1922) asserts that the radium treatment of cancer is most complicated: the dose depending largely upon the changes occurring in the tumor as a result of its nature or position. The possibility of actually stimulating an outlying portion of the growth, which is radiated insufficiently, must be borne in mind. Before absolute success with radium therapy is possible, a great many physical measurements of the different parts of the human body and of pathological growths and a complete investigation of the nature of the lethal dose for cancer cells are necessary. This information will give an approximate idea of the proper method of treating tumors in different locations, although even then some insurmountable biological difficulties, such as the resistance of the organism as a whole and of the tissues locally to cancer, will require elucidation.

Even in inoperable cases, the author reports that 7.5 per cent. of all the cancer cases treated with radium the patients are alive and well after periods of two to seven years and that in many cases of carcinoma of the cervix uteri, breast, skin, lip, etc., the patients have been saved from death by radium; endotheliomata of the parotid gland and spindlecelled sarcomata show still more gratifying results. A great many palliative cures, short of absolute cure, have been seen, while in nonmalignant conditions, like exophthalmic goitre, Hodgkin's disease, keloid, cavernous and capillary nevi, the percentage of cures is high. Radium therapy is specific for excessive uterine hemorrhage and spring catarrh.

Radium in Keloids.—E. M. Daland (*Surgery, Gynecology and Obstetrics,* January, 1923) says that it seems probable that every keloid can be destroyed by radium if a sufficient dose is used. Silver filtration (one millimetre) should be used in keloids of recent origin, in children, in people of dark complexion, and in exposed areas, such as the face. The dose should be from thirty to sixty millicurie hours, according to the age of the patients. Practically unfiltered tubes should be used on all other keloids. The dose should be from fifteen to thirty millicurie hours a tube. It should be explained to the patient that ulceration will result from this type of treatment. There is no evidence to show that the destructive doses damage the tissues so that the lesions recur. There is no lessening of the tendency of an individual to develop keloids.

Technic of Intrauterine and Intravaginal Application of Radium.—H. Eymer (*Zentralblatt für Gynäkologie,* July 22, 1922) discusses the principle of the Heidelberg procedure of irradiation for carcinoma of the uterus with radioactive substance with the elongated forms of applicators. The other unusual feature of the procedure is the use of medium large amounts of radioactive substances for single treatments. All of the preparations used are administered with brass filters one mm. thick and accurately fitted. Some of the applicators are tubular and contain about twenty-five mg. radium element, being more or less concentrated according to the length of the tube. One applicator has the shape of a capsule and another that of a hemispherical shell placed over a massive brass hemisphere, which acts as the filter. The latter is especially indicated in crateriform carcinomata. In carcinoma of the cervix, the external os must be found with a sound and when found the canal is dilated with longitudinally perforated Hegar dilators and the uterine cavity is measured. The appropriate applicator is selected according to the size of the cavity, which is then filled with a series of apparatus. If long filters are required they can be screwed together in tandem fashion. In carcinoma of the body of the uterus, the concentrated preparations are placed above and the less concentrated preparations are applied below. Twin filters are applied in a wide uterine cavity. Additional applicators may be applied in the crater and in the vagina for carcinoma of the cervix. The hemispherical or the capsular forms are used, depending upon the structure of the cervical tumor, and a special apparatus is used to hold them in place.

When radiating the vaginal tube, the bladder and rectum must be protected. A distance of at least 0.8 cm. from the external wall of the filter (made of hard rubber and in various shapes and sizes according to the shape and size of the vagina) should be maintained. A modified Zwanck pessary is used where radiation of the parametrial tissues is desired. The duration of the application can be determined only biologically according to the nature of the malignancy. The fact that the propagation of the tumor has probably extended beyond the palpable portion of the tumor must always be borne in mind and the guiding principle should be to arrange the radiation in such a manner that by using every possible form of application the greatest amount of radiation is obtained at the greatest possible distance from the source of radiation, namely by crossfiring. The most practical duration for intrauterine radiation was found to be three times twenty-four hours and for intravaginal radiation twice twenty-four hours, at one sitting so as to avoid the cumulative effect on the connective tissue.

RADIANT LIGHT IN THERAPEUTICS

Bactericidal Action of Ultraviolet Light.—S. Bayne-Jones and J. S. Van Der Lingen (*Bulletin of the Johns Hopkins Hospital,* January, 1923) describe methods by which exact determinations may be made of the wave lengths of light which kill bacteria. They used the sparks of various metals as sources of ultraviolet light; except in a few experiments when it was necessary to take advantage of sunlight because of its greater intensity. In most of the work the quartz spectrograph was used. The absorption spectrum of a bacterial emulsion was correlated with the limits of the bacterial action of light. The effect of temperature and the influence of hydrogen ion concentration upon the limits and velocity of the germicidal action of ultraviolet light were determined. The authors draw the following conclusions from this work: The bactericidal action of light is confined to the ultraviolet region of the spectrum, beginning at 350 u u and extending with increasing intensity to the shortest wave lengths measurable with a quartz spectograph: 185.6 u. These limits coincide with the absorption of ultraviolet light by bacteria. The temperature coefficient for the bactericidal action of light was found to be 1.05 over a range of 10° C., and the constant u in the formula of Arrhenius was 934 to 975. An increase in hydrogen ion concentration of the fluid in which bacteria are suspended during their exposure to ultraviolet light increased the velocity of the bactericidal action. The accelerating effect began at Ph 4.6, the isoelectric point, and was very strong in fluids more acid than this. Neither temperature nor the hydrogen ion concentration rendered bacteria sensitive to the longer wave lengths of light.

A New Protection Against Injuries From Phototherapy.—I. M. Eder and Leopold Freund (*Wiener klinische Wochenschrift,* August 10, 1922) report that æsculin protects the skin. It is obtained from the bark of young horse chestnut trees in the spring, which is a bad time for the decortication of trees. Experiments showed that naphthol sulphuric acid absorbed the short waved portion of the spectrum (up to 350 u u). The alkali salts absorb also the violet. The authors successfully used a two to four per cent. lanolin salve and showed that the word antilux could be distinctly written with the salve on the skin which had been irradiated. The skin area so treated shows a normal hue. The most important element in the treatment is the thorough rubbing in of the salve. No harmful effects were observed. The salve should be rendered insoluble in water (lanolin) so that sweat will not interfere with its action. This preparation can be used as a substitute for the expensive æsculin. It is called antilux.

Quartz Lamp Irradiation in Pemphigus Neonatorum.—Richard Gralka (*Monatsschrift für Kinderheilkunde,* July, 1922) reports partially successful results with the quartz lamp irradiation in four out of five cases, as far as a considerable shortening of the course of the disease is concerned. After three to four irradiations, the danger of autoinfection was overcome. In two cases, in which the life of the children was at least jeopardized, secondary infections were avoided by the prompt healing under the influence of the quartz lamp and the outlook as regards life was considerably improved. Quartz lamp irradiation treatment does not render the usual drug therapy dispensable, but nevertheless it is a valuable adjunct and it should therefore be tried in all prognostically doubtful cases.

Influence of Light in the Prevention and Cure of Rickets.—Alfred F. Hess (*Lancet,* August 19, 1922) asserts that it is impossible to appraise accurately the rôle of light in the incidence of rickets until more is known of the dietetic deficiency or errors in a qualitative sense. Inasmuch as breast feeding does not protect against rickets, diet alone cannot be the dominant etiological factor. Rickets occurs even in babies whose mothers are well nourished and who partake of a liberal and varied diet. The conclusion must be that breast milk, although valuable, is provided with but a scant factor of safety against rickets and that an additional protective influence is needed, namely light. In London and New York, the milk is far more adequate and normal than the supply of light.

Behavior of Germs on the External Skin Toward Ultraviolet Light.—Ludwig Schmidt (*Centralblatt für Bakteriologie, Parasitenkunde u. Infektionskrankheiten,* Heft 4, 1922) concludes that germs lying superficially on the skin are destroyed to a great extent by ultraviolet light in doses which show no injurious secondary effects on the skin itself, but that the more deeply lying germs are protected from the effects of the rays. The sensitization of the skin by the spraying of eosin on it makes no difference. This effect was evidenced on the germs of suppuration, which had already produced a slight inflammation of the skin and also on the germs that are present on the normal skin.

Treatment of Lupus by the Diathermy Condensor Spark.—A. E. Milner (*Lancet,* December 23, 1922) is convinced that this form of treatment does not fail to cure lupus vulgaris simplex and as this is the first stage of the catarrhal form, the importance of treating these cases early is apparent. The ideal patch for treatment is the small one; more extensive patches can be cured, but the treatment is tedious. This treatment is superior to scraping owing to the fact that the diathermy spark actually destroys the tubercle bacillus, whereas curettage leaves behind many tubercle bacilli in the vicinity of the wound. The cases of lupus that persisted were those with tuberculous affection of the mucous membrane either of the nose, gums, or lacrymal apparatus. The latter parts should be examined carefully, as otherwise reinfections are bound to occur. In butterfly lupus of the face, where the nasal mucosa is also affected, the nose should be treated first and cured as much as possible before commencing diathermy treatment of the face.

Observations on the Effect of Artificially Produced Light on the Capillaries of the Skin and Its Evaluation as a Biological Criterion for the Determination of the Dose in Deep Röntgen Therapy.—Gustav Welsch (*Münchener medizinische Wochenschrift,* No. 15, 1922) finds that an observer, who is well versed in the appearance of the capillaries after deep röntgen therapy, will be warned against too excessive a dose by a pronounced pathological test picture of the capillaries and, in its presence, will administer a suberythematous skin dose. This provocative irradiation should last for two minutes. If an apparently macroscopically normal looking skin in a patient who is about to be subjected to deep röntgen therapy shows signs of an excessively marked light reaction, and if this suspicion is strengthened by an examination of the capillaries, presenting an abnormal picture, the skin should be tested with the mercury quartz lamp for twelve minutes; after six hours the skin should again be examined. If the circumscribed; marked hyperemia and exudation of the bloodvessels is observed, the length of the intervals of the röntgen irradiation should be adjusted accordingly; but if the visual field, even after the light provocation, appears poor in circulation, the usual skin erythema dose may be exceeded in deep röntgen therapy.

Diathermy in the Treatment of Diseases of the Bladder in the Female.—Iwan v. Büben (*Zentralblatt für Gynäkologie,* July 15, 1922) asserts that diathermy is a valuable adjunct in therapy, owing to the promotion of the healing power associated with the increased temperature and resulting hyperemia and the other physiological powers, especially in regard to its powers of relieving pain in the painful cystitides and in tenesmus. Diathermy is produced by means of an electric current of high tension and rapid alternation, which produces heat in the deeper tissues. The amount of heat developed depends upon the intensity of the current, the resistance of the perfused tissues, and the size and form of the electrodes. A large and a small electrode are used, the current being made to pass from the larger electrode to the smaller one, so that most of the current and heat are developed at the latter. If the electrode is too small, a coagulation of the tissues results with the use of strong currents; this is called a cold cautery and is used with good results for the extirpation of bladder tumors, chiefly papillomata.

The author treated with diathermy fifty cases, chiefly of cystitis, with incontinence and painful urination. The treatment may be extravesical or intravesical. The extravesical treatment is given with olive electrodes (with a thermometer embodied in the instrument) applied intravaginally; the external electrode, consisting of a lead plate as large as the palm of the hand, is applied over the bladder at the symphysis. The results with this form of treatment are not as good as those obtained with the intravesical form. For this form of application, the author devised an irrigating electrode, through which the bladder is first filled with one hundred to three hundred c. c. of physiological saline solution and the electric current is then applied in the same manner as in the extravesical treatment. This treatment is given three times weekly for ten to twenty minutes, with a current of 0.5 to 1.0 ampere. Marked improvement in the symptoms is noticed after ten treatments. The best results are obtained in the cases of painful urination and in enuresis nocturna. Diathermy is contraindicated in every form of inflammation associated with a rise of temperature. It is especially indicated where all other forms of treatment are of no avail.

Additional Indications for Quartz Lamp Irradiation. — Hans Reh (*Strahlentherapie,* 1922) showed that in diseases of the joint capsule, ligaments, adjacent muscles and tendons, both the acute and more chronic diseases were cured without exception in a very short time without recurrences. In diseases of the synovia, which have not as yet produced any considerable hindrance to the smooth joint action and therefore could have produced only slight changes in the articular surface, the disease was cured by several irradiations, but recurrences were seen unless about eight irradiations were administered. In cases with advanced destruction of the smooth surfaces, as in the joint, the effect from treatment was only that of a certain lessening of the pain, inasmuch as there was an increased sensitiveness for a few hours after the irradiation and a distinct lessening of the painfulness later; a cure or a permanent diminution of the pain was not possible. Therefore, in every case which presents such symptoms and such a course, two to four attempts with quartz lamp irradiation should be made.

Death From Electrical Currents.—Karl Meixner (*Wiener klinische Wochenschrift,* July 13, 1922) asserts that the resistance of different individuals to the electric current varies exceedingly and, therefore, there is a great difference in the strengths of lethal currents. An analysis of four cases, in which death resulted from electricity, showed that all the patients had organic lesions, not necessarily severe but sufficient to lower the general resistance, such as are usually designated as of unknown cause; in these cases even weaker currents may have a lethal effect in the presence of such lesions. The body constitution and the inferiority of the general body structure apparently play an important part in death from electricity; the predisposing factors are usually cardiac disturbances.

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PEDIATRICS.

Vomiting in Newborn and Young Infants.—C. Page Lapage (*Practitioner*, July, 1922) says that if the vomiting is metabolic in nature, a period of starvation, the length of which depends upon the severity of the symptoms, must be adopted, and, in the meantime, the dietetic error eliminated. If there is overfeeding with breast milk, the mother's diet must be revised, and, if necessary, the breast pump used to diminish the amount taken by the infant. Some breast milks are of bad balance; for instance, a thin, watery milk often contains too much protein and too little fat; in such cases, the addition of fat in the form of milk to the mother or mixed feeding may be of great value.

For protein vomiting sodium citrate (two grains to the ounce of milk) is a useful remedy, though it causes constipation. Heat diminishes the size of the curds, and increases their digestibility. This is why dried and cooked milks are so often more digestible than fresh milk. Peptonizing or the use of predigested foods may help. Finally, resort may have to be made to whey and meat juice, or whey and albumen water, with albulactin, which forms a useful protein addition for curd vomiting babies. Sometimes a sweetened, condensed milk is useful before coming down to whey. Whey mixtures are hardly sufficient to nourish a baby for long, and after four days, or, at the most, a week, it is better to find some more sustaining food.

For fat vomiting, which is common, milk and water mixtures without any added cream can be used. One of the most useful mixtures for out patient babies is a milk and water mixture, sterilized for thirty minutes and sweetened, with no cream but with extra fat in the form of emulsion of cod liver oil, half a teaspoonful three times a day to infants from six months to one year. Many babies who vomit on a full fat mixture will take this well, because not only is the protein rendered more digestible by cooking, but also the fat of cows' milk, which is the real difficulty, is reduced in amount and replaced by the more digestible cod liver oil emulsion. In the same way, when the full cream dried milks cause vomiting, the half cream dried milks may succeed. When ordering two or three days' starvation to restore tolerance, water can be used at first. Many cases of vomiting are accentuated by giving babies milk, when they are really thirsty and in need of water.

Basal Fibrosis in Children.—G. T. Hebert (*Lancet*, June 10, 1922) states that the basal pneumonic residues in children appear in roentgenograms as an increased translucency instead of the usual and expected opacity and are often mistaken for tuberculosis. A roentgenogram in such a case showed the following features: 1, displacement of the heart half an inch to the right; 2, increased translucency of the lower half of the right pulmonary field; 3, absence of the smaller shadows of the bronchial tree and replacement of the larger by a fine linear marking; and 4, shadows suggesting some increase of fibrous tissue round the bronchi at the root of the lung, with slight dilatation of the bronchioles at the edge of the translucent area. This finding may be explained by the fact that probably the normal shadows of fibrous tissue are not seen because the surrounding lung parenchyma is avascular, emphysematous, edematous, or in some other condition making it unusually translucent. From the pathological viewpoint, edema is most likely to be the cause; clinically, the finer crepitations may be produced in collapsed areas, but the medium sized and typically moist râles suggest the presence of fluid in structures larger than the alveoli. Possibly the interstitial tissue becomes edematous, with the resulting roentgenographic picture described above. This translucency is important evidence in the differentiation of nontuberculous fibrosis from tuberculous fibrosis of the lungs as it does not occur in the latter.

Regeneration of Blood in Infancy.—Hans Opitz (*Monatsschrift für Kinderheilkunde*, November, 1922) attempted to determine the effect of the well known factors that favor the regeneration of blood in the anemic conditions of infancy. This is still a subject of extensive discussion. Considerable differences are noted in the growing and mature organisms: drug therapy, which plays an important part in the anemias of adults, is of considerably less importance in the anemias of infants, whereas the alimentary factors most necessary for the development of anemias in early infancy are relatively insignificant in later life. The amount of transfused blood necessary to bring the number of corpuscles in the child to normal were computed by the author and this dose was repeated after four to ten days as often as seemed necessary. The results were very good except in two cases of lymphosarcoma and myeloid chloroma. The author believes that the injected corpuscles are not destroyed, because the signs of regeneration, such as erythroblasts, basophilic stippling, etc., disappear from the blood. It may be that the injected blood takes up part of the function of the blood and gives the bone marrow time to rest and recover. A mixed diet and a moderate reduction of the milk may hasten recovery.

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Acrodermatitis Chronica Atrophicans and Its Relation to Scleroderma

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Acrodermatitis chronica atrophicans is sometimes confused with scleroderma. Some believe it to be only an aberrant form of scleroderma. For example, Sutton, in his textbook, says: "The disorder is to be differentiated from scleroderma, particularly scleroderma of the edematous type. Arndt, who has investigated the question carefully and exhaustively, holds that confusion can occur only in the earlier stages of the disease—an opinion which is shared by Finger and Oppenheim. Herxheimer and others hold that the two maladies are often practically indistinguishable in the atrophic stage. Judging from the result of my own studies, I should say that some cases of acrodermatitis chronica atrophicans, as the disease was originally described by Herxheimer and Hartmann, cannot be differentiated from the edematous form of scleroderma at any stage. In fact, the two affections are probably identical."

But this view is by no means one which is unanimously accepted. To judge from the numerous papers bearing such titles as Cutaneous Atrophy and Scleroderma or Acrodermatitis Chronica Atrophicans and Scleroderma, one would infer that there had been left no loophole for further controversy about the matter. Nevertheless, a perusal of the relevant literature, together with certain definite impressions gained from the discussions of a number of cases of acrodermatitis atrophicans in various dermatological societies, reveals the fact that not only is there no unanimity of opinion on the subject, but that a great diversity of opinion evidently exists in the minds of many dermatologists.

CLINICAL MISCONCEPTIONS.

To understand the clinical picture presented by acrodermatitis chronica atrophicans and its various manifestations in different stages of the disease, it will be necessary to clear up certain misconceptions which prevail, even among those who specialize in dermatology.

To begin with, it is a fact that only about one third of the cases of acrodermatitis chronica atrophicans reported in the literature present evidences of sclerotic skin; the other two thirds are examples of ordinary, noncomplicated atrophia cutis—dermatitis atrophicans progressiva. In approximately two thirds of the cases, therefore, sclerotic tissue, scleroderma or hard skin is conspicuous by its absence, throughout the course of the malady. Hence it must be evident that not all cases of acrodermatitis chronica atrophicans are "probably identical" with scleroderma, since one is essentially an atrophying process and the other essentially a sclerosing process.

The next important thing to consider is the fact that the sclerosis of the skin occurring in isolated or diffused areas in acrodermatitis atrophicans, takes place in areas of skin which have already undergone various degrees of atrophy: the sclerosis is consecutive to the atrophy. Therefore, since true scleroderma cannot begin with atrophy, these sclerotic patches cannot be true scleroderma. This statement applies to those sclerotic patches which appear within the domain of the atrophying dermatitis; usually on the upper and lower extremities. The question of sclerodermalike lesions on the chest, back and other parts of the trunk, will be discussed later.

SCLERODERMA AND ATROPHY.

In a certain proportion of cases of scleroderma, the end stage of the process is characterized by atrophy of the affected areas of skin. Does scleroderma always end up with atrophy? Probably not. Of 508 cases of scleroderma recorded by Lewin and Heller, only thirty-one showed evidences of atrophy. But the mere fact that some sclerodermas terminate in complete atrophy, in no way justifies the assumption that these atrophic lesions bear any clinical or nosological relationship to the atrophic lesions of acrodermatitis atrophicans. Indeed, it

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is my belief that the final atrophy of scleroderma can be differentiated from the atrophy of dermatitis atrophicans on clinical grounds alone, at least in most instances where an actual comparison can be made with two patients viewed side by side. In this belief I am supported by some of my colleagues. The smooth, soft, velvety feel, the ease with which the skin may be lifted in fine folds, the peculiar shade of color, the "crumpled cigarette paper" appearance—in short, the anetoderma of Jadassohn—are characteristics of acrodermatitis atrophicans, but are lacking, in greater part, in the clinical pic- or even as the atrophic end stage of scleroderma,

INDIVIDUALITY OF THE TWO DISEASES.

Granting, however, for the sake of argument, that a given area of acrodermatitis atrophicans is clinically indistinguishable from a given patch of scleroderma in its atrophic period, what justification is there for the belief, expressed by some, that the two diseases are not only related, but sometimes identical? None whatever. Regardless of the end stages of both affections, one still remains an atrophying dermatitis, the other still remains a scleroderma. If we were to follow such a course of specious reasoning in making our clinical diagnoses and in the teaching of our students, to be consistent we would be constrained to label the atrophic end stage of pityriasis rubra of Hebra as atrophia cutis, or even as the atrophic end stage of scleroderma, since Hebra's disease may also terminate in anetoderma. One might go further and say the same of a healed and atrophic favus of the scalp, or of a healed lupus erythematosus, or even of leprosy.

THE DIAGNOSIS OF ACRODERMATITIS CHRONICA ATROPHICANS.

The diagnosis of acrodermatitis chronica atrophicans is made, clinically, not by focusing one's eye and concentrating one's mind on a patch of hard, waxy yellow, bound down skin on the leg, or about the elbow, and ignoring the other phenomena which go to make up the whole, but rather by considering the sum total of clinical symptoms, together with their definite relations to the chronological data furnished by the patient. A child who is afflicted with xeroderma pigmentosum, for example, dies of cancer; but still the diagnosis remains xeroderma pigmentosum, no matter how much the cancer may obtrude itself into the picture, no matter how it may dominate and overwhelm all the other features of the disease. A patient with Recklinghausen's disease may present many different types of lesions: freckles, angiomas, birthmarks, soft and hard tumors, adenoma sebaceum, even bone changes and cerebrospinal disturbances—the whole symptom complex constituting Recklinghausen's disease. So with acrodermatitis chronica atrophicans, the diagnosis is established by recognizing the existence of a change in the skin manifesting itself clinically by a primary atrophy (histologically, by a primary dermatitis); once this primary atrophy is established and recognized as such, what follows in the course of the malady does not in any way alter the diagnosis, any more than the advent of cancer alters the original diagnosis of xeroderma pigmentosum.

In acrodermatitis atrophicans, different and diversified clinical phenomena may appear, consecutive to the primary atrophy of the skin. Of these, the most frequent and the most prominent are the patches of hard, bound down, indurated tissue, occurring chiefly on the extremities, resembling scleroderma; there may be a superimposed scaling and eczematous dermatitis; there may be, late in the course of the disease, several bluish red, hemispherical, pea to walnut sized, smooth, indurated tumor masses about the elbows or knees; rhagades, even deep ulcerations, followed by carcinoma or sarcoma may appear (as has been recorded) about the ankles; these various consecutive clinical phenomena notwithstanding, the disease still remains acrodermatitis chronica atrophicans.

THE INITIAL STAGES.

To revert to the initial stages of the two maladies, its has been said by some writers that the initial stage of scleroderma, manifested in some instances by edema, is indistinguishable from the initial stages of some cases of acrodermatitis atrophicans, manifested by edematous, circumscribed, soft, bluish red, "boggy" tumors and infiltrations. These are the preatrophic infiltrative masses to which Herxheimer and Hartmann first called attention, in 1904. I have had the opportunity to observe, over a period of years, what is probably the most pronounced example of such preatrophic infiltrative tumors recorded in the literature, and have published a study of the clinical and histological features of this patient's disease, together with illustrations of the skin and of the microscopic sections. I have observed two more patients presenting these preatrophic infiltrations. Without going into tiresome and unnecessary details, I can say that as far as the clinical appearances in these three patients are concerned, these boggy masses reminded me no more of the edematous stage of scleroderma, than they did of scabies. What they did remind me of, were the articles on acrodermatitis chronica atrophicans, by Herxheimer and Hartmann, Herxheimer and Schmidt, Herxheimer alone, and Finger and Oppenheim, to say nothing of numerous other publications on the subject, which I had read. That they did *not* remind me of scleroderma is not for lack of having seen scleroderma in all its manifestations during a score of years' work in the large clinics of New York. No; the reason they did not bring scleroderma to my mind was simply because they did not look anything like any scleroderma I had seen until then, or expect to see in the future.

ACRODERMATITIS CHRONICA ATROPHICANS AND DIFFUSE ATROPHODERMA.

Acrodermatitis chronica atrophicans, with its diverse clinical manifestations, has been described in scores of publications by European and American writers. Prior to 1902, the year of the appearance of Herxheimer and Hartmann's first paper, the cases were reported under various titles: an atrophic condition of the skin of the legs; symmetrical cutaneous atrophy; idiopathic atrophy of the skin; diffuse idiopathic atrophy with scleroderma; diffuse atrophoderma; dermatitis atrophicans, and so forth. In society transactions, several cases in America were recorded as cases for diagnosis. In 1905, Herxheimer published another paper in English, in *The Journal of Cutaneous Diseases,* and since then, the cases of acrodermatitis chronica atrophicans began to be differentiated, in this country, from those of "diffuse idiopathic atrophy of the skin," although not consistently; for example, Irvine's case, reported as idiopathic atrophy of the skin, was an example of acrodermatitis atrophicans. The differential diagnosis between the two clinical entities was discussed in a paper which I published in 1915. The chief points in differential diagnosis are the following: In acrodermatitis atrophicans there is often a preatrophic inflammatory process, characterized by the formation of edematous, elevated, smooth, bluish red, boggy tumors or infiltrations; these occur on the upper and lower extremities, where the disease almost invariably begins; hence Herxheimer's designation, acrodermatitis. Almost always, when the process begins on the feet, the toes remain unaffected, the atrophy beginning at the bases of the toes and progressing over the feet, ankles, legs and thighs, extending often to the pubic region in front, and over the buttocks, to the iliac crests, behind. In rare instances, however, the entire trunk may be implicated. (Such an example will be described further on.) Strips of sclerotic skin in the form of ulnar bands, less frequently tibial bands, sometimes appear. Diffuse and isolated plaques and patches of sclerodermalike skin may appear in the midst of tissue which has already undergone atrophy; the skin of the dorsi of the feet, the ankles and the lower third of the legs is often hard, waxy looking and bound down to the underlying structures; at times this is also seen on the forearms. In the end stages, paraarticular fibrous nodules sometimes occur, chiefly about the elbows and knees; one of the best examples of these nodule formations was described by Ketron, of Baltimore, and several have been described by Oppenheim, of Vienna, who was the first to call attention to them. Whether the postatrophic, sclerodermalike lesions ever become finally transformed into atrophic tissue is a moot question; Oppenheim does not think that such a change ever takes place; I have never seen any evidences to support such a contention.

Diffuse idiopathic atrophy may also occur on the extremities, but it does not do so uniformly, as in acrodermatitis atrophicans. Usually the process first appears on the trunk, spreading insidiously, until the entire skin may be implicated. There are no preatrophic inflammatory infiltrations or tumor formations. The ulnar band is rarely encountered; the sclerodermalike infiltrations are absent in the large majority of cases; when present, the surface of these areas is much more transparent, soft and wrinkled than that of acrodermatitis atrophicans: the postatrophic, paraarticular nodules may, according to Finger and Oppenheim, appear in both forms of atrophia cutis. In the end stages of these two forms of cutaneous atrophy, the clinical appearances resemble each other so closely that a differentiation is difficult or not possible: both are designated as dermatitis atrophicans diffusa et progressiva.

A thorough presentation of the whole subject of cutaneous atrophies was published, in the form of a monograph, by Finger and Oppenheim, in 1910. Nearly all of the cases of acrodermatitis atrophicans published in the world's literature, to that year, are reviewed in this little book.

AMERICAN LITERATURE.

In going over the records of cases published in the United States I found that approximately sixty-five cases of acrodermatitis chronica atrophicans have been reported, under various titles, in American journals. About fifty of these were encountered in New York City. Of these fifty patients, I demonstrated thirteen before the local dermatological societies during the past ten years; the great majority of these were from Dr. Fordyce's service at the Vanderbilt Clinic.

Instances of the disease are probably seen in all large centres of population in the United States, especially those having a large quota of immigrant residents. I should judge that in the city of New York alone, with its enormous alien population, there are constantly between one hundred and one hundred and fifty cases of acrodermatitis atrophicans. The disease occurs almost exclusively in the foreign born; the nationalities are chiefly Russian, Polish, Roumanian, German, Austrian, Swedish, Norwegian and Irish. Frank examples of the malady have been reported, so far as I know, in only two American born citizens. In New York City, with its large proportion of Central European immigrant Jews, one might easily get the impression that the disease predominates in that race; but an analysis of the situation does not bear this out. In a recent paper on this subject, Pautrier and Eliascheff stated that of seventy cases described in the literature, two were reported from America [in Americans?], two from France, three from Italy, while all the rest emanated from German, Austrian and Polish sources. During a year's sojourn in Strasbourg, they encountered two examples of the disease. In Germany, Max Jessner presented six patients before the *Schlesiche dermatologische Gesellschaft,* July 8, 1922, and said that during the first six months of the year 1922 he had encountered seventeen cases of the disease.

Thus it is evident that, little as we know about the malady, it is by no means a rare one.

ACRODERMATITIS CHRONICA ATROPHICANS AND SCLERODERMA.

Neither Finger nor Oppenheim, in their separate publications and in their joints monograph, admits that the sclerotic areas of acrodermatitis atrophicans are true scleroderma. Oppenheim goes so far as to say that he does not believe that the two diseases ever coexist in the same patient; later on, he modifies the statement by adding that if they do apparently coexist, it is purely a coincidence. On the other hand, the simultaneous occurrence of both processes has been reported by Rusch, Arndt, Herxheimer, Nobl, and, in this country, Kanoky and Sutton, Kingsbury and others. Heuck (Germany) reported and illustrated such an example in the *Ikonographia Dermatologica,* but made no histological examination of the sclerotic tissue; I consider Heuck's case to be one of ordinary acrodermatitis atrophicans with associated sclerotic lesions about the knees. In Nobl's case, microscopic sections of the indurated tissue taken from the back revealed what he called "keloidlike scleroderma." Sutton, from studies of microscopic sections from one of his patients, convinced himself that scleroderma formed a part of the disease. Sutton's histopathological findings are indisputable, but the description of the clinical features of his patients' dermatoses does not correspond with those of frank acrodermatitis atrophicans. Herxheimer and Schmidt wrote a critique of Sutton's paper and said:

"There exists a great diversity of opinion regarding the histological findings not only in dermatitis chronica atrophicans but in scleroderma. To quote Krzysztalowicz, who investigated diffuse scleroderma, a comparison of the latter with the (pathologically) closely related process, atrophia cutis idiopathica diffusa, leads to no elucidation. In both the changes in the beginning affect the vessel walls and their surrounding tissue; both lead to the disappearance of the adipose and subcutaneous connective tissue, and merging of the latter with the cutis. Then the process diverges in that, in atrophia cutis the atrophy of the collagen and glands follows rapidly, leading to thinning of the skin with complete disappearance of the elastic tissue, while in scleroderma, atrophy of the collagenous tissue progresses slowly, with, however, the final sacrifice of these and the elastic fibres.

"In conclusion we would emphasize that the clinical picture of idiopathic atrophy and the atrophic stage of scleroderma may present many similarities. We are, however, far from holding the opinion that acrodermatitis and scleroderma in the atrophic stage are identical, as maintained by Vignolo-Lutati."

In Kingsbury's patient the clinical appearance was that of a combined atrophia cutis and scleroderma, the latter occurring within the territory of the acrodermatitis atrophicans, namely, on the upper and lower extremities. No sections of the sclerotic tissue having been made, the interpretation of the case is inconclusive.

Scholtz (Los Angeles) recently summarized the various points of the controversy as follows:

"A feature that gives rise to the most confusion and greatest difficulties in the differential diagnosis of acrodermatitis chronica atrophicans is the sclerodermalike infiltration. In many cases reported under a diagnosis of acrodermatitis chronica atrophicans, sclerodermalike infiltrations were so marked as to give rise to a doubt whether they were atypical cases of atrophic scleroderma or a combination of acrodermatitis chronica atrophicans with scleroderma. In the writer's opinion, the infiltration in acrodermatitis chronica atrophicans is not identical with the sclerodermic infiltration and can be differentiated, both on clinical and pathological grounds.

Clinically, a typical case of scleroderma and a typical case of acrodermatitis chronica atrophicans differ so widely that they can hardly give rise to confusion. It is the atypical and transitional cases that render a differentiation at times difficult. But even then, irrespective of characteristic distribution, there is one clinical symptom that can be taken as a fundamental differential feature; namely, the presence, in acrodermatitis chronica atrophicans, of a diffuse inflammatory hyperemia, which has a tendency to extend beyond the area of infiltration. Scleroderma proper is a purely degenerative process and not an inflammatory one, and in its uncomplicated form it is manifested by a whitish color, paler than the surrounding tissues, and not by an inflammatory redness. A dark red and bluish hue, due to the network of translucent veins shining through the atrophic skin in the later stages, has nothing to do with the inflammatory redness preceding and accompanying the infiltration stage.

Another feature of equal importance in the differentiation of true scleroderma from acrodermatitis chronica atrophicans in the infiltrative stage is the surface marking of the patch. In scleroderma it is smooth, shiny, waxy; in acrodermatitis it is rough and shows a branlike exfoliation of mild degree. In fact, in its early stages, acrodermatitis may resemble somewhat a mild exfoliating dermatitis.

Histopathologically, a confusion may arise only in the atrophic end stage, the difference in the early stages being marked enough to prevent confusion. In scleroderma it is universally agreed that there are practically no changes in the epidermis, and that the hypertrophy of the collagen and elastic fibres is the most constant and characteristic change. In acrodermatitis there is no such increase in these elements, even in the infiltrative stage. On the contrary, an early disappearance of the elastic fibres is regarded as the most constant and characteristic histological feature. It is only in the atrophic end stage that the histological picture in both conditions shows the same phenomenon of the decrease of elastic fibres due to the pressure of the infiltrate. In this stage a differentiation is difficult and is to be made on clinical grounds.

Thus, both clinically and pathologically, it would seem to be justifiable to regard the infiltration in acrodermatitis as a different process from that of scleroderma, even though at certain periods there is some clinical resemblance. In some cases, such as those reported by Kanoky and Sutton and by Kingsbury, it must be admitted that there is a possibility of the coexistence of both conditions, possibly due to the same etiological factors.

The sclerodermalike infiltrative process observed in acrodermatitis is not identical with scleroderma, either clinically or pathologically, though the combination of acrodermatitis and true scleroderma is possible."

THE SCLEROSIS IS CONSECUTIVE TO THE ATROPHY.

Oppenheim described a female patient, aged twenty-seven, who presented an acrodermatitis atrophicans of the lower extremities. The process began seven years previously. The skin over the dorsi of the feet, about the malleoli and the lower third of the legs was hard, bound down, of a yellowish white color, and could not be raised into folds. Here it resembled scleroderma. The skin of the upper portions of the legs, the knees and thighs presented the usual soft, flabby, velvety, bluish red, atrophic picture with its associated crumpled cigarette paper appearance—anetoderma. This was a typical example of acrodermatitis atrophicans, presenting the two clinical features so often observed: the atrophy and anetoderma of the skin of the upper part of the legs, knees and thighs, and the sclerotic, bound down skin of the lower portion of the legs, the ankles and the dorsi of the feet.

How is this clinical picture properly interpreted?

Is it one of atrophia cutis, or of scleroderma, or of both conditions occurring simultaneously?

In this patient, as in all other presenting areas of sclerotic and atrophic skin on the same limb, the outstanding fact was definitely ascertained from the patient's history, that the atrophy preceded the sclerotic change for a period of years. In one of my own patients, the skin about the ankles first began to harden and become bound down fully twelve years after the atrophic stage had been in existence in that location. The sclerosis of the skin is therefore evidently a process consecutive to the atrophy, and hence cannot be regarded as a true scleroderma. The sclerosis may supervene shortly after the establishment of complete atrophy; or months or years later; or it may not appear at all; in the last case, the patient may have acrodermatitis atrophicans for thirty years and die of old age, without ever manifesting the least evidence of sclerosis either within the territory of the acrodermatitis atrophicans, or on any other portion of the integument. I have had under observation two patients with long standing acrodermatitis atrophicans, in neither of whom sclerotic patches appeared, despite the age and the chronicity of the affection on the lower extremities. Assuming that my diagnosis in these two patients is correct, what possible relationship can there be between their chronic, progressive cutaneous atrophy of the lower extremities and a scleroderma? Aside from a presumptive etiological relationship—the possibility of endocrinous disturbances bringing about both conditions—there exists no relationship between the two conditions, at least in my opinion. And this purely clinical viewpoint, put forth by several experienced and very competent dermatologists over twenty years ago, still maintains its hold among those who have the advantage of seeing the largest number of cases. Among these I venture to say that Finger held an enviable reputation; and Finger, in his publications, strongly stresses his belief that there is no relationship between true scleroderma and the sclerosis accompanying acrodermatitis atrophicans; and that the diagnosis of scleroderma, applied to anetoderma, is always an erroneous one, whether the disease is encountered in its earliest stages, or in the stage accompanied by sclerotic formations, or by fibrous nodular lesions about the elbows and knees. In one of his papers he said:

"With regard to the relationship existing between anetoderma and scleroderma we have already called attention to the fact that a certain group of cases, the socalled morphea of French and English authors, give the impression of being transitional stages between the two diseases. It would be necessary to demonstrate a more intimate relationship between these two processes to convince me that anetoderma and scleroderma may exist conjointly in the same individual. Their simultaneous occurrence would point to a common etiology. Such, however, is not the case. We have mentioned the fact that the diagnosis of scleroderma has been made erroneously with reference to the infiltrated lesions of acrodermatitis chronica atrophicans, as well as the tense forms of atrophy which occur in the course of diffuse anetoderma in those areas in which the skin is naturally (physiologically) more or less tense and drawn—namely the dorsum of the foot and the leg, anteriorly. After a thorough perusal of the literature I am unable to convince myself that a combination of the two forms of tissue changes may coexist; and if such a change does occur it is open to question whether an etiological factor is common to both, or whether we are dealing merely with a coincidental appearance of two unrelated dermatoses."

HISTOPATHOLOGY OF THE SCLEROTIC TISSUE.

So much for arguments based on, 1, clinical observation; 2, the patient's history, and 3, the literature. We shall now consider the histopathological findings in: 1, sclerotic tissue within the territory of acrodermatitis atrophicans, and 2, sclerotic tissue outside the territory of acrodermatitis atrophicans.

The minute structure of the areas of sclerotic tissue within the domain of the atrophic portions of the skin—the extremities—has been very thoroughly described in a number of European publications within the past ten years. Studies of such sections, taken from two of my patients, were published in a paper by me, and in another jointly with Dr. Snyder. In these, the various differences between the microscopic structure of the sclerotic tissue and that of scleroderma are dealt with, but only in a general way. One of the best descriptions dealing with this phase of the subject is that of Oppenheim; and as his findings are discussed in minute detail, they are of sufficient interest and importance to be transcribed here, at least in part.

HISTOPATHOLOGY OF SCLEROTIC AND ATROPHIC TISSUES.

Oppenheim excised a piece of skin from a patch of sclerotic tissue bordering an area of atrophic skin, on the dorsum of the foot, in a woman who had typical acrodermatitis chronica atrophicans. Thus half the section consisted of sclerotic, the other half of atrophic tissue.

Weak magnification revealed an apparently normal epidermis, which in some places ran in a straight line, in others in long wavy lines, and showing no evidences of rete pegs. The area with straight epidermis represented the sclerotic portion of the section, the wavy area the atrophic portion. Throughout the section the corium was widened; the connective tissue bundles were more dense in the deeper portions, and, in the sclerotic half of the section, they appeared also close under the epidermis. In the atrophic area, the connective tissue bundles in the subpapillary portion of the cutis were more delicate in appearance and were not so widespread. The cellular elements of the connective tissue were more numerous in the atrophic area, while the cellular infiltrations in this region were more sparse; in the sclerotic area these infiltrations were more numerous and more closely packed about the bloodvessels and glandular structures in the corium. Beneath the epidermis of the atrophic portion there were many dilated, thin walled vessels, filled with blood cells; in the sclerotic area, these were entirely absent.

With higher magnification it was seen that the epidermis as a whole showed little deviation from the normal; the cells of the stratum corneum were loosely attached, and, in the absence of the stratum lucidum and granulosum, they rested directly on the stratum mucosum. In the atrophic portion, the rete Malpighii consisted of seven to eight rows of cells, the basal cell layer was normal, and there was a sharply defined separation between epidermis and corium. The cutis consisted of straight, dense bundles, mostly running parallel to the surface, closely packed, and becoming denser toward the subcutis. In the uppermost layers, the lumina of the bloodvessels were almost entirely obliterated; they were surrounded by masses of plasma cells and round cells, extending to the upper border of the cutis.

In the atrophic portion the epidermis was thinner; the stratum lucidum and stratum granulosum were absent, the rete cells were flattened and in places composed of only three or four layers. The basal cell layer, devoid of rete pegs and corresponding to the wavy surface of the cutis, showed distinct evidences of edema. The connective tissue of the corium was here well supplied with cells and bloodvessels, being especially numerous just beneath the epidermis. Here also were seen numerous large and small dilated vessels filled with blood cells. There was no vascular obliteration. The cellular infiltration, especially about the bloodvessels, was much more pronounced in this portion of the skin; the infiltrations were less sharply defined and their bordering cells seemed to blend with isolated fixed connective tissue cells. In the cellular masses just beneath the epidermis were seen elongated spindleshaped cells, arranged in parallel rows and resembling fibroblasts. Among these were mononuclear leucocytes and capillary vessels.

The sweat glands were surrounded by plasma cells; mast cells were very few in number; some pigment was seen in the basal cell layer; isolated collections of hemosiderin occurred in the cellular infiltrates.

With respect to the elastic tissue, the microscopic findings were of greatest interest. In the sclerotic portion, not only was the elastic tissue preserved close up to the epidermis, but it actually was increased in amount. At the junction of epidermis and cutis, it formed a bordering strip of elastic tissue, such as Unna described in scar tissue. From this strip fine prolongations extended toward the surface, while downward prolongations also made their way in thick strands. They merged with the cellular infiltrates, being more dense at their peripheries. Toward the atrophic portion of the section, these strands became less and less pronounced in the deeper layers of the cutis, enmeshing only the denser bundles of connective tissue.

In that portion of the section which corresponded to the line of junction of the atrophic and sclerotic areas of skin, these strands of elastic tissue appeared as though they had been cut down upon, from above; in other areas they were so densely packed that almost no connective tissue bundles were visible between their strands.

In the atrophic portion (except in certain places to be mentioned later) there was complete absence of elastic tissue in what had been the papillary and of connective tissue in the deeper layers of the cutis there were a few sparse elastic tissue strands, widely dispersed here and there. Futher down in the subcutis they were more numerous, but here also were zones entirely devoid of elastin. The strands were disposed mostly in direct relation to the infiltrating cells or noninfiltrated bloodvessels.

In many places the elastic tissue appeared in the form of clumps, little broken down heaps and small particles; in isolated spots in the tissue there were also delicate, fine, elongated, pale staining fibres, running along with bundles of connective tissue. In other portions of the cutis were seen masses of elastic fibres which were stained deep black, arranged in dense and irregular clumps, not disposed in relation to the connective tissue bundles, some of them surrounding the cellular infiltrations, others lying entirely free. Other masses of fibres were arranged in various bizarre shapes and designs. Islands of elastic tissue were especially prominent in two or three places just beneath the epidermis; these were the only instances in which elastin could be demonstrated above the subpapillary layer, in the atrophic portion of the skin. In the cutis and subcutis the elastic tissue was in great part preserved about the vessels, although it showed degenerative processes here and there; in some vessels in which the intima was thickened, there were deeply stained dense elastic fibres within the vessel walls.

The significance of these findings is not easy of interpretation, although that pertaining to the atrophic area, in which the elastic tissue is wholly absent, is not so difficult. In the atrophic area the histological findings correspond to those of dermatitis atrophicans; only the well marked development of connective tissue in the deeper layers of the cutis, does not rightly belong in the picture. This development of connective tissue is to be regarded in the light of a secondary manifestation beginning in the deeper layers of the cutis and gradually forcing itself toward the surface. This is evidenced by the presence of bloodvessels with their thickened walls and their dense plasma cell infiltrations, gradually decreasing toward the surface. The bloodvessels of the subpapillary and prexisting papillary layers are merely dilated, their walls being unaltered, showing almost no infiltration, or at most a moderate round cell infiltration. Here, the skin is, clinically, still atrophic, bluish red, wrinkled and easily movable over the subjacent tissue, namely, the thickened reticular layer of the cutis.

In the stiffened, white, anemic portion, this sclerosing process, beginning in the deep portion and advancing to the superficial region of the cutis, has extended close to the epidermis; in this area the bloodvessels are compressed and obliterated, surrounded by dense plasma cell aggregations and fibroblasts. It seems that this sclerosing process has its origin in the bloodvessels, about which the embryonal tissue, giving rise to the connective tissue, first develops. These vessels show distinct evidences of endovasculitis and perivasculitis.

The histological findings pertaining to the elastic tissue are the hardest to interpret. How is one to explain the aggregations of deeply stained, dense elastic strands lying in the midst of an elastin free connective tissue; and the presence of broken down and disintegrated clumps of fine, delicate and faintly staining strands, in the sclerotic portion of the section?

It is best first to consider the elastic strands about the bloodvessels and their infiltrating cells. Here they are exceptionally dense, staining a deep black, running partly parallel to the connective tissue bundles, partly in irregular and haphazard directions, sometimes extending radially, apparently emanating from the infiltrate. These manifestations are especially well marked at the junction of the atrophic and sclerotic portions of the section. From these appearances, one may safely assume that there is a new formation of elastic tissue, derived from the vessels and their infiltrates, and not from preexisting, old elastic tissue strands. Similar findings were recorded by Cesaris Demel in sclerotic tissue.

However, the question whether the newly formed elastic tissue originates in the cellular infiltrations, or intracellular substance, or in the elastica of the bloodvessels, is not germane to the present problems, although the evidence is strongest in favor of a blood vascular origin. Thus the newly formed elastic tissue begins about the vessels and their infiltrates, extends prolongations into the connective tissue, eventually disposing itself in the manner already indicated, in the sclerotic part of the skin.

"How, then, is this sclerotic change to be regarded from the histopathological viewpoint?

"It cannot be interpreted as an ordinary or hypertrophic scar, for the elastica in scar tissue is either diminished or wholly absent. It must, therefore, be regarded in the light of an end product of a sclerosing process, affecting the atrophic skin; this process has its origin in the deeper bloodvessels of the cutis and is accompanied by a regeneration of elastic tissue strands.

"Furthermore, this sclerosing process, having its starting point in the deeper bloodvessels and extending toward the surface, can evidently not be scleroderma. Its development within the atrophic territory of skin; the fact that it begins in subcutaneous tissue; the dense plasma cell infiltrations about the vessels; the flattening and obliteration of the papillæ; the condition and disposition of the elastic tissue—all speak against the assumption that we are dealing with a true scleroderma. If true scleroderma were to be taken into consideration, it should be regarded from the viewpoint of an adventitious complication—the simultaneous occurrence of two different diseases.

"The opinion entertained by some observers, namely, that the atrophic process represents an end stage of an existing scleroderma, is negated by the patient's history, by the histopathological findings, and by data forming the sum and substance of the literature."

SCLEROTIC LESIONS OTHER THAN THOSE OF THE EXTREMITIES.

Some cases of acrodermatitis chronica atrophicans have sclerotic lesions not only on the extremities, but also on the trunk, the abdomen, chest and back. Clinically, these resemble true scleroderma or morphea much more than do the lesions on the extremities. They are often sharply defined, their borders are often clean cut, their color is that of old ivory and they are markedly indurated. The surface is smooth, glistening and free of gross dilated vessels. But their appearance differs from that of ordinary scleroderma circumscriptum, in that, instead of being surrounded by normal skin, they are surrounded by, and actually imbedded in, skin which already shows evidences of atrophy and hyperpigmentation. Here again, as on the extremities, the sclerotic formation is consecutive to the atrophic process.

A patient illustrating this condition is at present under our care at the Vanderbilt Clinic. She is aged sixty-eight, and has a typical acrodermatitis atrophicans which began about ten years ago. Beginning at the bases of the toes, the skin of the entire lower extremity is involved in the atrophic process to a marked degree; the skin of the buttocks, abdomen and chest, which has only recently been invaded, presents unmistakable evidences of early atrophy, accompanied by marked hyperpigmentation; but there are as yet no evidences of anetoderma. On the buttocks, abdomen and chest are several distinctly infiltrated, sharply defined patches of sclerotic skin, closely resembling morphea. The skin below the clavicles and over the sternum presents a peculiar mottled appearance, closely simulating certain cases of dermatitis lichenoides chronica atrophicans.

It seemed to be especially desirable to study a section of skin obtained from sclerotic tissue located outside of the area of typical acrodermatitis atrophicans, to enable one to study its histopathological features as compared with those of true scleroderma. A section was removed from such a patch on the patient's right breast.

HISTOPATHOLOGY OF LESION FROM THE BREAST.

Low power.—The epidermis is flattened, showing a thin and wavy outline. The stratum granulosum is represented by a single layer of cells, the thinning of the epidermis being at the expense of the prickle cell layer. The basal cell membrane is intact and sharply defined, showing, in places, an increase of pigment granules. The papillary bodies are absent. The bloodvessels in the upper cutis are few in number, moderately dilated, a few of the larger ones being surrounded by a cellular infiltrate. The lymphatics are moderately dilated. The bloodvessels in the deeper cutis are sparse, small, with thickened wall. From epidermal layer to fatty layer, the collagenous tissue is composed of wavy strands, many of them dotted with isolated fibroblasts; the bundles of connective tissue are in part parallel, in part they run in different directions. In between these bundles of connective tissue are seen more faintly stained and less clearly defined strands of collagen. In the upper portion of the cutis the collagenous bundles are more closely packed than those below, the latter being arranged more in a parallel course; they are thicker than those above and the intrafascicular spaces are wider. Near a remnant of a sebaceous gland, the arrector muscle seems well preserved, the gland itself being surrounded by dense connective tissue bands. Only one follicle is preserved, and it is surrounded by a cellular infiltrate. The nerve structures of the deeper cutis are intact.

General view, low power.—These findings point to an inflammatory process, resulting in a sclerosis of connective tissue, which is not uniform in character. In the upper portion of the cutis, the sclerotic process is characterized by the formation of more or less distinct strands or bundles of collagen, while in the lower cutis there is a more uniform involvement of the collagenous tissue as a whole.

High power.—The epidermis is composed of from five to seven rows of cells, the granular layer represented by a single row of cells. There is neither parakeratosis nor hyperkeratosis. The vessel walls in the upper portion of the cutis are thickened, due to edema rather than to hyperplasia; the walls of most of them are indistinct and somewhat glassy in appearance. The walls of the deeper blood vessels are homogeneous in appearance. The endothelium of all of the vessels is swollen, projecting into the lumina, causing partial occlusion of most of those seen beneath the epidermis, in the upper cutis. The infiltration is moderate, chiefly about the bloodvessels, predominantly consisting of round cells; but some of the infiltrations also show a considerable sprinkling of plasma cells. The collagen of the upper cutis appears in distinct strands, of which the fibrils are well defined; in the deeper portion of the cutis, the fibrillar structure is much less apparent. These strands for the most part are homogeneous in appearance, showing a bluish tint with the hematoxylin eosin stain. This appearance is attributed to the formation of collastin. In the upper cutis, some of these connective tissue bundles are distinctly granular, appearing to be undergoing disintegration or crumbling—also a feature of collastin change. The upper cutis contains numerous fibroblasts. In the deeper cutis are deposits of granular substance lying in between the bundles of degenerated collagenous tissue—a breaking up of the collagen.

Elastic tissue.—The elastica is preserved from epidermis to fatty layer, and appears to be less well defined about the areas of infiltrations. With the high power, the fibrils are seen as fine, broken tendrils, running up to the epidermal layer, in some areas well defined, in others indistinct. In the regions of the perivascular infiltrations, the elastica is, for the most part, absent; but in some areas, the elastica is seen to come quite close to the bloodvessels, appearing as small fibrils, fine clumps and irregular deposits of granular substance. Here and there, fibres are seen apparently emanating from clumps of infiltrate, but none coming directly from the vessel walls themselves. The upper corium presents long strands of elastic fibres running parallel to the connective tissue bundles, with wavy outlines. In areas where the collagen is crumbled and broken up, the elastica has a tendency to form clumps.

In the bloodvessels of the deeper cutis, the vascular elastic fibres are preserved, but appear to be swollen; in some bloodvessels there is a distinct ring of fragmented and granular elastic tissue. Throughout the entire area the fibres are more or less fragmented, coarse, swollen, and in places, form clumps. About a sebaceous gland the elastic fibres seem to be unaltered.

Although it was not possible to demonstrate a direct relationship between newly formed elastic tissue fibres and existing fibres in the walls of the bloodvessels, the histopathological structure of the sclerotic patch on the breast of my patient will, on comparison, be seen to correspond in all essential details with the histopathological changes of sclerotic tissue removed from the foot. With the exception of the changes described with reference to the collastin formation, the structure of the tissue from the isolated patch on the breast is practically the same as that described by Oppenheim, in a specimen removed from the sclerotic area of the foot.

SUMMARY AND CONCLUSIONS.

Acrodermatitis chronica atrophicans, a variety of dermatitis chronica atrophicans diffusa progressiva, is a distinct clinical entity.

In a certain proportion of cases, sclerotic tissue appears about the ankles, lower legs, knees and forearms; this sclerotic tissue superficially resembles true scleroderma at times, but in reality it has not the character of true scleroderma, in any but the very last stage of development.

A small proportion of patients present sclerotic patches, not only on the extremities, but also on the trunk. These patches are located in skin which, as that of the extremities, has already undergone various degrees or grades of atrophy; their histopathological structure is practically the same as that of the scleroses of the limbs.

The histopathological structure of sclerotic skin, both from the extremities and the trunk, in patients with acrodermatitis chronica atrophicans, does not correspond to the structure of scleroderma in any of its clinical manifestations, with the possible exception of the terminal stage of complete atrophy, with its complete absence of elastic fibres.

The sclerosis is always a secondary phenomenon. It is conceivable that a patient with acrodermatitis atrophicans may also have scleroderma. If the areas clinically simulating scleroderma are imbedded (and hence surrounded by) atrophic skin, it is to be assumed that the sclerosis sprang from atrophic territory, hence cannot be true scleroderma. Should such areas appear as isolated, morphealike, well defined patches, entirely surrounded by normal skin, it may be assumed that they are manifestations of true scleroderma.

The doughy, boggy swellings and infiltrations which sometimes precede the atrophying changes in dermatitis atrophicans, do not resemble the edematous stage of scleroderma enough to cause confusion in diagnosis. The terminal paraarticular nodule formations about the knees and elbows have nothing in common with scleroderma.

Scleroderma becomes atrophic—and especially anetodermic—in only a very small proportion of cases; according to Lewin and Heller, thirty-one out of 508 cases. Whether it finally becomes atrophic or not, scleroderma bears no relationship to acrodermatitis atrophicans, since the first is a sclerosing process and the second an atrophying dermatitis.

In conclusion, I wish to acknowledge my indebtedness to Professor Fordyce for his permission to use the clinical and histological material from his clinic; to Doctor Satenstein for his aid in the interpretation of the sections; and to Dr. H. J. Parkhurst for his aid in collecting the literature.

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A Study of the Death of the Full Time Extrauterine Fetus *in Situ* and Its Scientific Value

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The uterus is the organ destined by nature for the reception, lodgment, and development of the human ovum after fertilization, and for the safety and welfare of the mother and child it is so peculiarly endowed that with the gradual evolution of the product of conception it becomes remarkably well fitted for both gestation and parturition. Not infrequently, however, it happens that the fertilized ovum on its way toward the uterus becomes arrested and this arrest most commonly takes place in some portion of the Fallopian tube, a structure which anatomically and physiologically is ill suited for harboring and nourishing an actively developing oosperm. Arrested in such an abnormal situation it nevertheless attempts to adapt itself to these untoward conditions and strenuously endeavors to make the maternal tissues meet its needs and furnish it with all the nutrient materials it requires.

The Fallopian tubes—two in numbers—are situated one on each side of the uterus in the upper and free margins of the two broad ligaments. Each tube, which is of about the size of a goose quill and measures nearly four inches in length, is enveloped closely in peritoneum except over about one sixth of its most dependent surface, where it rests on the areolar tissue in the broad ligament and where the latter constitutes a sort of mesosalpinx. The mucous lining of the Fallopian tube is somewhat plicated longitudinally and is continuous with that of the uterus, but it differs from the latter in that it possesses no glands. Directly underneath the peritoneal covering of the tube there is a small amount of areolar tissue and between the peritoneal covering and the mucous membrane are two delicate layers of muscular fibres—an external or longitudinal and an internal or circular. The blood supply to the Fallopian tube, which is sufficient to meet its ordinary everyday requirements, is derived chiefly through a few small offshoots from the ovarian artery, a vessel which, running tortuously in the broad ligament from the side of the pelvis, devotes its supply of blood chiefly to the ovary. The capillary vessels in the fibrovascular layer of the mucous lining of the tube are apparently constituted like the capillaries of any ordinary mucous corium. Because the blood supply to the Fallopian tube and the substance of the broad ligament is very ordinary, every fetus which attains maturity outside the uterus is enabled to do so in virtue of an accessory supply of blood obtained by the structure in which the fetus had been lodged, contracting adhesions with the omentum, and sometimes with the bowel as well. These adhesions are not associated with any inflammatory reaction but result merely in consequence of the greatly increased vascular activity in the structure harboring the product of conception and the demand of the fetus for an adequate supply of all those materials necessary for its development and growth. The blood supply to the uterus is on a very different footing and is capable of furnishing all the nutriment necessary to meet the requirements of two, three, or even four fetuses.

When a fertilized ovum becomes arrested in the Fallopian tube, it endeavors forthwith to anchor itself by chemiotaxis on that surface of the tube which rests in the substance of the broad ligament, as here alone is it likely to be able to arouse that amount of vascular reaction which is necessary for its immediate requirements. The area of this vascular reaction is not limited but involves more or less markedly the bloodvessels of the entire tube, and if sufficient nutriment is not obtainable from the immediate implantation area, then the oosperm in a definite attempt to safeguard its existence becomes villous over its entire surface. The chorion possesses everywhere the power of throwing out villi, but the product of conception that becomes universally villous is pathological and has become covered all over with villi because it failed in a normal manner to secure for itself that amount of pabulum that it required. So ill fitted, however, are the capillaries of the Fallopian tube to undergo the progressively increasing amount of dilatation that the actively developing product of conception demands, that the process of gestation seldom proceeds far before some of the attenuated capillaries rupture and the hemorrhage that results, not only causes the embryo to perish, but may endanger the life of the mother. It must be remembered that, on account of a more or less prolonged continuance of the patency of the breach in the wall of such enormously dilated capillaries, recurring hemorrhages are likely to take place and sooner or later the blood thus thrown out escapes into the peritoneal cavity by bursting the greatly thinned Fallopian tube. On this account an ectopic gestation seldom proceeds far before it is brought to an abrupt termination and consequently it rarely happens that an extrauterine fetus is so safeguarded as to reach maturity. Out of sixty-three cases of ectopic pregnancy that I have myself dealt with by abdominal section in six only had the fetus attained maturity, and in all of these the infants had died before the mothers came under my observation and in each case the mothers sought advice simply and solely because childbirth had not yet taken place as had been expected.

In my article on the Natural Limit of the Duration of Human Gestation (1) I referred to the fact that although the maternal circulation in the placental area continued active and vigorous, the full time extrauterine fetus does not live on indefinitely in its mother's body but dies without a struggle at a definite and fixed time, unless delivered by the timely intervention of an abdominal section of the mother. Incidentally I may here observe that in all the cases of full time extrauterine pregnancy that I have had to deal with the infants were as well formed and as well nourished as any normal uterine infant could possibly be.

Scientists are well aware that almost daily for many weeks in succession a domestic hen may lay an egg furnished in very definite relative proportions and in exact amounts with all those materials —oxygen excepted—that the chick requires to enable it to complete its development and growth during the incubation period of twenty-one days, and it is most noteworthy that those materials are secreted partly by the ovary but partly also by the oviduct—two distinct and separate structures acting in unity. We know full well that some of the materials found in the egg do not exist in the same chemical state in the blood of the mother but are elaborated and altered by the remarkable powers and processes of the cells which secrete them. The presence of the varied substances in the egg cannot be accounted for by any physical or mechanical laws. Although the nutritional processes connected with the development and growth of the chick take place outside the mother's body and can be observed, we are, strange to say, woefully ignorant of the nature of those chemical changes which the yolk and white of the egg undergo before they are fit to be used by the cells of the embryo itself, and practically all we do know is that they are acted upon and absorbed and transported by itinerant cells which are themselves embryonic.

As to the manner in which the placenta functions, we have at present to confess that our knowledge thereon is extremely meagre and that it has been advanced but little since the days of John and William Hunter—a century and a quarter ago. By a careful study, however, of the conditions obtaining in association with the evolution of the placenta in cases of ectopic pregnancy and in association with the death of the full time extrauterine fetus *in situ*, our knowledge of the actual processes by which the placenta fulfils and carries on its functions may be very materially and reliably augmented.

It will readily been admitted that the nutritional requirements of the embryonic cells for development and growth are very different from those of the maternal cells for maintenance and repair, and that the placenta as the sole intermediary between the embryo and the mother must not only exercise a well regulated selective power but must, by the vital activity of its cells, break up and synthesize many of the substances which it abstracts from the maternal circulation. I am fully convinced that the placenta must carry on its functions much in the same way as the mammary glands during activity carry on theirs.

During embryonic growth, and especially in the early days of embryonic growth, water plays a most important rôle, and it must be evident that the osmotic powers and processes of the cells of the embryo must be very different and very differently regulated from those of the cells of the mother. So, too, the need of the embryo for mineral substances is relatively on a different scale from that of the mother. This applies markedly even in the case of iron. Bunge, who has devoted some attention to this question, says that "in a series of estimations of iron in the total organism of young dogs, cats and rabbits, I have shown that the amount of iron is the highest at birth and that it gradually diminishes afterwards. At least five times more iron is found in the liver of newborn than in that of full grown animals. In the same way the other tissues must possess their store of iron which can be drawn upon to meet the rapid development of the blood." There is, too, on the part of embryonic cells, both vegetable and animal, a remarkable and great demand for fat, and as we find in human milk, which is nature's food for the newborn infant, saturated fatty acids containing six, eight, ten, twelve, and fourteen carbon atoms, fatty acids different altogether from those stored up in the tissues of the mother and drawn eventually into her blood, we are justified in assuming that these same members of the fatty acid series are synthesized in the placenta in the same manner as the mammary glands synthesize them.

It is more than probable, too, that as large quantities of nonnitrogenous food materials are required during the early stages of embryonic growth, the chief carbohydrate used by the embryo is a form of sugar, like lactose, and as this form of sugar does not exist in the maternal blood it will have to be manufactured by the placental cells. Be this, however, as it may, the placenta evolved in association with an extrauterine fetus which attains maturity is in every respect as functionally active and vigorous as any placenta developed normally in the uterus. Structurally the only difference between the two placentæ is that, while the uterine is so related to the uterus as to be shed at the time of parturition, the extrauterine placenta becomes so intimately incorporated with the maternal tissues that it virtually becomes a portion of the mother's body. It is, as a matter of fact, in virtue of this firm union that any extrauterine fetus is enabled to attain maturity and it is on this account, too, that when operating for the removal of a full time extrauterine fetus, even though it is known that the fetus must have been dead for weeks, no attempt should be made to remove the placenta, as the mother is almost certain to die in consequence of the uncontrollable hemorrhage which is certain to result. We must recognize and realize that the placenta which has sufficed to bring to maturity an extrauterine fetus is to be viewed for the time being as a portion of the mother's body and must be left undisturbed to undergo gradual absorption *in situ*, which it does because it has ceased to function. It is noteworthy that in days gone by, before extrauterine pregnancies were dealt with by abdominal section of the mother, the infant and placenta were allowed to disintegrate and undergo absorption, and under such circumstances fetal bones or portions of fetal bones not infrequently were passed by the bowel or bladder.

Now, whether the product of conception is lodged in the uterus or in the Fallopian tube the maternal tissues take no part in the actual production of the placenta itself, which is entirely an embryonic formation. However, as the placenta formed in the uterus has to be shed, the uterine mucosa makes provision for this and keeps on secreting a decidual material which prevents a connective tissue union between the placenta and the uterus. It is truly a somewhat remarkable and inexplicable fact nevertheless, that in a fair percentage of the cases of ectopic pregnancy decidual membrane forms very early in the cavity of the uterus and this decidual membrane, which may be shed as a complete cast of the uterus and with practically no hemorrhage, contains fusiform and epithelial cells but is constituted chiefly of small round cells in a homogeneous matrix. It is no doubt a secretory product formed very much in the same way as the egg shell membrane in the bird's egg is formed.

Regarding the manner of the initial implantation of the product of conception we have no justifiable reason for believing that it differs according to whether it takes place inside or outside the uterus. Time was when it was believed that the oosperm which developed in the uterus became lodged in a specific ovigerous chamber formed by the decidua—the socalled decidua reflexa growing up, around, and over the oosperm and thus shutting it off from the uterine cavity. This dogma which had for centuries retained its sway has, however, quite recently been superseded and there now prevails the belief that the oosperm, by its socalled trophoblast, attacks the mucous membrane of the uterus and either actually devours it or secretes a digestive fluid which dissolves it and that then the oosperm is enabled to insinuate itself into the substance of the mucosa and form therein for itself an ovigerous chamber, the inlet opening becoming sealed over by a structure known as the decidua capsularis.

From a careful scrutiny of facts I am confident that the product of conception which proceeds to develop normally in the uterus neither forms for itself nor has formed for it an ovigerous chamber distinct and separate from the uterine cavity, and that wherever it may proceed to develop it retains in its early days its implantation hold on the maternal tissues simply and solely by chemiotaxis.

A short time ago I had occasion to remove by supravaginal hysterectomy a uterus in an early state of pregnancy. The operation was necessitated on account of a large fibroid growing from the posterior wall of the uterus and so filling the pelvis as to cause retention of the urine. The case is somewhat unusual and is worthy of note. The patient was thirty-five years of age and although she had been married nine years she had never previously been pregnant. At the time of the operation she had gone nineteen days over her usual menstrual period and this was the first and only period she had ever missed. On this account solely I suspected the existence of early uterogestation and was careful during the operation not to disturb the state of the uterus. The uterus, slightly enlarged and presenting the vascular appearances of early pregnancy, looked as though in a plastic state it had been thrown against the large fibroid and had stuck to its anterior surface. There were no other fibroids. The uterus and tumor were removed *en masse* and placed immediately after the operation in preservative fluid. On the following day the specimen was dealt with. It was then remarked that the contracted and hardened uterus had caused a small spherical body, like a small grape, to project at the amputated surface of the uterus—the supravaginal amputation having been effected at about the level of the internal os uteri. On carefully opening the cavity of the uterus the small projecting globular body, which was the product of conception and was quite smooth, over three fourths of its surface was found to be attached to the anterior wall of the uterus by a fanlike *chorion frondosum*. Neither to the naked eye nor under the lens did the surface of the chorion show any evidence that it possessed or ever had possessed a covering derived from any portion of the mucous lining of the uterus; neither was there any sign about the uterine wall that the product of conception had ever been lodged in a special ovigerous chamber, the confines of which it had burst and been extruded from. The chorionic sac was about five-eighths of an inch in diameter.

The embryo which had been developing normally up to the time that the uterus was removed from the mother's body measured in its greatest length 6.5 millimetres. It was closely shrouded in its amnion because there was as yet no amniotic fluid. The sac of the chorion itself was fully distended by a clear albuminous fluid. Here, then, we had a perfectly normal and actively developing product of conception which, according to my method of computation, contained an embryo which was nineteen days old and which product of conception showed not the slightest evidence that it could ever possibly have been located in an ovigerous chamber distinct and separate from the uterine cavity. Moreover, if we scrutinize the development of the bilobed placenta, an occasional occurrence in the human female but a normal occurrence in the case of many monkeys, such as the Cercopithecus sabaeus and the Macacas cymologus, in which it is asserted that an ovigerous chamber is formed by the trophoblast in exactly the same manner as it is formed in the human female, and take into consideration too the occasional occurrence in women of that somewhat remarkable and troublesome condition known as placenta prævia, it is absolutely impossible to believe that the oosperm forms for itself a specific chamber in the uterine mucosa. In the case of monkeys, where the placenta is bilobed, the two lobes more or less discoid in shape and of about the same size are usually situated one on the anterior and the other on the posterior wall of the uterus. At the fundus and sides of the uterus the two lobes are separated from each other by nonplacental smooth parts of the chorion. The umbilical vessels join the fetal surface of one placenta and the interplacental vascular communication is maintained by tortuous vessels traversing the smooth nonplacental portions of the chorion.

When Turner's communication on the Placentation of the Apes appeared (2) it was evident that that distinguished anatomist, in common with such scientists as Breschet, Owen, and Rolleston, accepted the tenet that the product of conception which produced a bilobed placenta was developed in an ovigerous chamber distinct and separate from the cavity of the uterus. With scientists as with other persons the wish is sometimes father to the thought and here it would seem we have a case in point, for gradually the belief is being abandoned that the bilobed placenta in the monkey is developed in an ovigerous chamber shut off from the uterine cavity. What is true of the bilobed placenta in the monkey is likewise true of the bilobed placenta evolved at times in association with the human product of conception. There can, as a matter of fact, be little doubt that the bilobed placenta as developed either in the human female or in the monkey is evolved in the uterine cavity itself, just as the cotyledonary and annular placentæ are in some of the lower mammals. This obtains, too, in the case of the well formed discoid placenta which is so situated in the human female occasionally as to constitute the condition known as placenta prævia, since it is inconceivable that a placenta evolved in a chamber lodged in the uterine mucosa in the immediate neighborhood of the internal os could ever be anything but misshapen.

In coming to a conclusion on this important and interesting scientific question it must be remembered that those who cling still to the dogma that the human product of conception develops in a specific ovigerous chamber assert that when the blood supply to the socalled decidua reflexa or capsularis is reduced the villi of the chorion in relation to that structure degenerate and being compressed between the chorion and the opposed reflexa now rapidly disappear. Or take again the fact that during uterogestation it not infrequently happens that as early as fourteen days after the first menstrual period is missed external hemorrhage may be noted in consequence of the rupture of one or more ill conditioned or badly supported capillary sinuses in the decidua serotina or placentalis area, and even although this hemorrhage may persist and be troublesome for a greater or less length of time the pregnancy may nevertheless proceed and the fetus reach maturity. Now it is quite clear that if in such a case the product of conception were lodged in a special chamber in the mucosa of the uterus, the blood escaping from ruptured vessels within its walls could only make its appearance externally by bursting the wall of the said ovigerous chamber, and it is inconceivable that this could possibly take place without the product of conception being at the same time destroyed. It is alleged, too, that as the placenta in the ovigerous chamber develops and the embryo grows the decidua reflexa or capsularis is stripped from the musculature of the uterus and thrust against the decidua vera of the opposite side and that these two veræ fuse about the fifth month and thereafter the reflexa or capsularis atrophies. Under such circumstances it must also be quite evident that blood emanating from the placental site and appearing externally during the first five months of pregnancy could only do so by breaking the decidua either directly or indirectly after tunnelling beneath it for a greater or less distance, but we have no evidence clinically or pathologically that the occurrence of external hemorrhage during the early months of pregnancy is ever associated with either of those events. Confronted, therefore, with facts of the aforesaid character it is imperative that we should now abandon the idea that the human oosperm ever devours or attacks the living formed tissues of its mother in order that it may form for itself a special gestation chamber. We can consequently only view as erroneous such a statement as "if the developing ovum be arrested in the Fallopian tube, the syncytium owing to the extreme thinness of the lining membrane quickly eats its way into and through the wall of the tube" (3).

Taking all facts into consideration I think there can be but little doubt that early implantation of the human product of conception, wherever it takes place, is effected by chemiotaxis. It must also be clearly understood that the fertilized ovum which comes to arrest and proceeds to develop in the Fallopian tube is enabled to progress and produce a mature fetus because the placenta becomes virtually a part of the mother's body and because the growing product of conception in its entirety insinuates itself into the substance of the broad ligament separating its constituent parts just as a cyst does which originates in the hilum of a more or less sessile ovary.

In my communication, The Natural Limit of the Duration of Human Gestation, already referred to, I drew attention to the fact that gestation, in the case of every woman who conceives, begins at a definite and fixed time and that that definite and fixed time is two days before the date when the first missed period was expected to make its appearance, and I instanced as a most valuable aid to the settlement of the very vexed question of the duration of human gestation the further fact that the full time extrauterine fetus dies at a definite and fixed time unless its timely delivery is effected by an abdominal section of the mother. I observed, moreover, that the infant died without a struggle and that the mother herself was wholly unaware of the probable time when her infant perished. Now I have no hesitation in asserting that the full time extrauterine fetus dies paralyzed from lack of oxygen and lack of mineral substances, because the limit of the duration of the functioning activity of the placenta has been reached and the cells concerned thereto have lost their selective powers. This abrupt termination of the life of the fetus is clearly due to oxygen starvation and mineral hunger, because as I have already remarked the full time extrauterine fetus at the time of its natural death is as well developed, as well formed, and as well nourished as any normal uterine fetus is at the time of its birth. Here, then, we have irrefutable proof that through the mediation of the placenta the gaseous interchange between the maternal and fetal circulations and the passage of all the other nutrients that the fetus requires for its growth and development are determined and governed by the vital quantitive selective powers of specific placental cells and are not effected purely and simply in a physical or mechanical manner as is generally believed. As a matter of fact, we know that the maternal circulation in the region of the placenta in the case of a full time extrauterine fetus continues vigorous and active for a greater or less length of time after the fetus dies and unless the fetal circulation fails in the manner I have indicated there is no apparent reason why the full time extrauterine fetus, instead of perishing at the definite and fixed time it does, should not live, one is tempted to say, indefinitely. I may observe incidentally that stillbirths due to oxygen starvation are of fairly frequent occurrence but the reactionary lowering of the vascular activity in the uterus associated therewith usually so impairs the irritability and sensitivity of the uterus that parturition may be delayed for days after the infant has perished.

It might of course be thought that the death of the full time extrauterine fetus *in situ* could reasonably be attributed to the advancement of those changes in the circulatory structures of the fetus which take place in anticipation of birth, but we have no evidence that the death is in any way connected with or dependent upon those changes. It is besides universally admitted that the alteration in the course of the fetal circulation is determined by the first inflation of the lungs with atmospheric air and we must recall that it is on this account that the infant born weeks before those changes in the circulatory structures are completed is enabled, not only to survive its birth, but to continue its independent existence.

Without the maternal and fetal bloods commingling in the full time extrauterine placenta we have become aware that the full time extrauterine fetus is enabled to attain maturity only if the placenta becomes virtually a portion of the mother's body, and from a careful scrutiny of facts it must be very evident that the death of the full time extrauterine infant at a definite and fixed time can only be due to the placenta as sole intermediary between the mother and infant losing at a definite and fixed time its functioning powers. In other words, the passage of all those materials which are requisite and necessary to enable the fetus to complete its development and growth, no matter where the fetus may be located, is determined and regulated by the selective powers of a vital character exercised by certain placental cells. The placenta, in fact, plays a rôle of an internal secretory organ functioning very much in the same manner as the mammary gland in a state of activity.

Supporters of the mechanical theory of the functioning of the placenta allege that by the physical laws of diffusion filtration and osmosis all the nutrient processes occurring through the placenta can be understood and explained. I, on the contrary, maintain that even the passage of the diffusible mineral substances which the fetus requires cannot be accounted for by physical laws, because the specific needs of the embryo for growth and development are very different from the nutrient needs of the mother, and because the relative proportions of the mineral and other substances circulating in the mother's blood are very different from the relative proportions which the placenta is required to furnish for the development and growth of the fetus.

The mere fact that certain substances capable of filtration when thrown into the blood of the mother pass into the circulation of the fetus, is no criterion, but a careful study of the conditions as a whole as they obtain in the case of the full time extrauterine fetus in its relation to its placenta is of the greatest scientific value.

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Primary Sarcoma of the Spleen

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At various intervals a case of splenic sarcoma creeps into literature and surgeons forget it until their minds are again refreshed with a new case. In the past few years I am unable to find in literature the report of an authentic primary sarcomatous spleen.

As a primary condition the spleen is rarely attacked by tumor growths and as a matter of fact secondarily it is nearly equally as rarely the seat of metastases of any great size. It does take place, however, usually by extension from the stomach. This can, of course, be readily explained by its buried position in the abdominal cavity, being protected by ribs, stomach, splenic flexure of colon, gastrosplenic omentum, phrenocolic and lienorenal ligaments and other peritoneal folds. It is quite free of mechanical irritations. The most plausible mode of infection, if sarcoma be an infection, is through its unusual blood supply, i. e., the endothelium of the capillary network coming into direct contact with the splenic pulp. I feel, however, that irritations do take place in people whose occupations cause a great deal of left sided bending and stooping or leaning to the left side and especially in persons whose spleens are somewhat enlarged by previous disease. On the other hand, when it attacks women I feel that an ill fitting corset may irritate an already enlarged spleen.

By far the most common form is the lymphosarcoma having its origin in the lymphoid structures. Other types are fibrosarcoma originating from the capsule and trabeculæ, large round cell sarcoma of endothelial origin, cavernous angiosarcoma of lymph vessel and cavity origin. I have been unable to find a case record of such an occurrence.

Weichselbaum (2) reported two cases, one a fibrosarcoma and the second a large round cell sarcoma both in young men. Council (3) reported thirty-seven cases of which seven were still living following sixteen splenectomies; three died after operation, five recurred, and one patient was lost track of. Others reporting cases are: Jepson and Albert (cured case); Willy Meyer (patient died); the journal (4) reports twenty-four undoubted cases of sarcoma of the spleen, eleven found at postmortem; of the thirteen splenectomies four patients died at operation, four of recurrence, one lost track of and two cured. Cohen and Reisman (5) had a case lasting six months without operation. Billroth had a case, in a woman of forty-three, in which he did a splenectomy. Fritsch (6) operated on a woman of thirty-one who lived a year in poor condition after extirpation. De Ritis, Sancereaux, Trelot and Clark and Whitney have reported cases.

The patients usually come in complaining of having had pain in the back several weeks, gradually getting worse. They complain of gastric indigestion and the presence of a gradually increasing mass in the abdomen, a growing palor and weakness.

The diagnostician must rule out the following most common conditions simulating malignancy: In the splenic type of Hodgkin's disease, when no other glands are involved an exploratory incision is essential. Hypernephroma and renal tuberculosis may be diagnosed by cystoscopic examination with urethral catheterization and the x ray. The chronicity of Banti's disease and the early secondary anemia make the diagnosis. Cyanosis, extraordinary increase of red blood cells and chronicity of the disease rule out Vaquez's disease. History of onset and jaundice—conjunctival lesions—enlarged liver point to family types of splenomegaly. Infarct and abscess of the spleen occur in the course of septicemia or pyemia and endocarditis or other febrile disease. In acute swelling of the spleen we find a history of a primary condition. Chronic swelling of spleen reveals a history of cirrhosis of the liver, chronic heart disease, leucemia and paludism.

In angioma of the spleen other organs are usually involved, especially the liver, skin, and omentum. The liver is first attacked. There is pulsation and murmurs over the organ. An exploratory operation is at times essential for a positive diagnosis for the masses of vessels often simulate metastasis.

In tuberculosis of the spleen an insidious onset and the presence of other foci in neighboring viscera will distinguish the condition. X ray, cystoscopic examination and bacteriological examinations aid materially in the diagnosis.

In syphilitic infiltration of the spleen the history and a positive Wassermann are valuable but one must not lose sight of the possibility of both conditions being present. The course of actinomycosis of the spleen and its similarity to abscess without a known possible cause should be suspicious. Exploratory operation confirms the diagnosis.

In malaria the onset, blood smears, clinical course and progress under treatment will rule out other similar conditions.

In hemolytic jaundice intermittent or remittent jaundice will rule out a malignant spleen unless both conditions are present. The finding of urobilin in the stool up to four gms., bile in the urine and increased fragility are important findings.

In tropical splenomegaly the protozoa from the spleen puncture will be found and it occurs in tropics and subtropics.

Uteroovarian disease may be ruled out by the history of the case and bimanual examination.

With the present day use of pneumoperitoneum in x ray diagnosis the various organs involved are more easily distinguished.

TREATMENT.

As yet the x ray and radium have not been given a sufficient trial, on account of the lack of material, to say that relief is given or that the process has been arrested, so I am of the opinion that the method of choice is surgical intervention. One should be extremely careful in the manipulation of the spleen both before and after operation. When possible cautery should be utilized. Adhesions should be broken up carefully. Most often there has been an adhesive process to the stomach and diaphragm and if superficial the bleeding points should be gone over with the cautery. The patient should be given deep x ray therapy postoperatively and care should be given to the first sign of recurrence keeping in mind the routes of spreading; first by direct extension usually attacking the stomach, diaphragm and peritoneum. Secondly, through the lymph channels to glands and other viscera. And thirdly through the blood stream especially to the heart and lungs.

PROGNOSIS.

As the patient is usually seen late in the course of the disease the hope of recovery is slight. When the cases have reached the surgeon early good results have been seen in the few cases reported. It is to be hoped that with the education of the public to consult physicians early, and with the wide increase and the advances in diagnosis I feel that the patients will come to operation and radiation early and the condition will not be looked upon as hopeless as heretofore.

Case I.—Miss B. L., aged twenty-two, a saleswoman, was referred to me for examination August 16, 1921. She complained of pain in the left side radiating to the back. It was cramplike in character and worse at night. She had had this pain since an attack of dry pleurisy three months previously which was treated by strapping. Two weeks prior to my seeing her she had noticed a mass in the left abdomen which was gradually getting larger. She suffered from gastric indigestion and constipation since the mass became apparent.

The patient had had measles, chickenpox and otitis media in early childhood, at nineteen a peritonsillar abscess and at twenty a fracture of the left tibia. The menstrual history was quite normal except for occasional attacks of leucorrhea. At twenty she noticed a swelling of the thyroid gland at the time of her period but it disappeared under x ray treatment.

Dr. Alfred Herzfeld and myself elicited the following physical signs: The patient was a well developed and well nourished girl with moderate pallor. The skin was dry and cold. The head and neck were normal. The heart was pushed up and rotated forward, but there were no adventitious sounds. There was tactile fremitus or rather a crepitation over the base of the left lung. There was dullness to flatness at the left base posteriorly continuous with a mass in the left abdomen.

On inspection there was a perceptible swelling over the left side of the abdomen reaching from the costal margin to the umbilicus. A slight movement with respiration was noted. The mass was firm and smooth with a sharply defined internal border extending from under the ribs in the left hypochondrium downward and inward to just below the umbilicus. It was more or less fixed, moving slightly with respiration. The right kidney was palpable and moved with respiration. On filling the stomach with gas I found that there was a tendency for it to lay on the right side of the abdomen. There was crepitation over the tumor mass probably due to a perisplenitis. The liver was not palpable. The extremities were normal, reflexes normal. The rectal examination was negative.

The patient was admitted to the Lenox Hill Hospital and came in on the service of Dr. Martin Rehling, who was chief of the surgical service at that time. After careful examination, review of findings and consultation with the medical men, it was decided to operate. Dr. Rehling's preoperative diagnosis favored a malignancy.

Dr. Otto Hensel's report (medical service) : "I was unable to find any lesion except a great enlargement of the spleen. The diagnosis rested between Gaucher's disease, Banti's disease and the splenic type of Hodgkin's disease, with the last least probable. There is a possibility of primary tumor; the rapid growth and the deformity of the chest wall speak for this." Dr. Hensel suggested an x ray for glands, urine examined for urobilin, blood examination to determine the resistence of leucocytes and the presence of reticulated cells and bile in the serum. He also advised exploratory puncture of the organ. The family history was investigated but no similar conditions were present. Dr. Hensel advised finally splenectomy and irradiation.

For two weeks prior to operation the temperature ran from 98.6° to 104°, usually higher in the afternoon. Two days before the operation it remained persistently high and patient suffered from epistaxis. The pulse from 80 to 120. Respiration, 18 to 24. Up to the day of operation she was given a soft diet with daily soap enema. Blood pressure was 98/50.

The urine was examined daily before operation; acid, specific gravity 1.014 to 1.027; clear light amber; albumin: 1-3 plus with occasional hyalin and granular casts up to 2 plus. Red blood cells, 2-3 plus, white, 3 plus, epithelial, 2 plus, no urobilin.

Blood: hemoglobin, 60-80 per cent. (complete rest in hospital increased the hemoglobin). Red blood cells, 4,600,000-4,800,000; white blood cells, 10,500-15,400; polymorphonuclear, 59-69 per cent.; eosinophiles, from nine per cent. two weeks before operation to three per cent. on day of operation (September 1, 1921). Small lymphocytes, 24-29 per cent.; large lymphocytes, 3-8 per cent.; no reticulated cells; no parasites. The Widal was negative, culture negative, Wassermann negative. The gastric contents were normal. The stool was negative for ova, parasites and blood at several examinations.

A preoperative diagnosis of primary sarcoma of the spleen or cystic spleen was made.

OPERATION.

September 1, 1921, two doses scopolamine (,02), novocaine ½ per cent. (Dr. Rehling). A left mid rectus incision was made from the costal arch to one and a half inches below the umbilicus. (Gas, oxygen and ether (thirty c. c.) anesthesia was started on opening the peritoneum.) It was found that the uterus was infantile, tubes and ovaries were normal. There was no mass in the appendix region. The liver was smooth. The spleen was immense, presenting a smooth surface but several large elevations were felt. The organ extended upward and backward and there were a few adhesions of the dome of the diaphragm and at the left of the spinal column. As the spleen was so tremendously enlarged it was impossible to bring the organ to the wound so two auxiliary incisions were made; one to the xiphoid and the other a transverse to the left for two and a half inches. The spleen was now dislodged and hot packs applied to the oozing surfaces under the diaphragm. The spleen was completely loosened from above downward and several friable areas were torn through at the vertebral column and the stomach. The pedicle was isolated and tied and spleen removed. As there were infiltration processes at the fundus of the stomach and the vertebral column a resection of the stomach was not attempted. As there was little oozing the wound was closed without drainage with superficial and deep chronic sutures. A row of heavy silk sutures was laid to give support to the abdominal wound. In spite of the fact that the patient was in good condition a transfusion was performed with 500 c. c. blood (citrate method). The whole operation took one hour and fifteen minutes. On August 25, 1921, stereoröntgenographic examination revealed a cloudiness at both apices more marked on the right side. Both hilus shadows were prominent. No evidence of glandular involvement was seen. September 27th, an area of density involving the lower left lobe and obscuring the left diaphragm from the fourth rib to the base was seen.

After a pneumoperitoneum röntgenographic examination revealed a large dense shadow occupying the left hypochondrium and left lumbar regions. Two distinct shadows were noted, the upper corresponding to the spleen was of lesser density. The lower overlapped the lower shadow of spleen. This lower shadow corresponded with that of a large movable kidney with the cortex apparently resting against the vertebral column and the lower pole on a level with the lower border of the fourth lumbar vertebra. There was ptosis and hypertrophy of the right kidney.

With these findings it was deemed wise to x ray the urogenital tract in spite of the fact that the surgical staff did not think the kidney was involved.

August 29, 1921, cystoscopy showed the bladder and both ureteral openings to be normal. The catheters entered easily and brought clear urine. Indigo carmine injected intramuscularly was excreted in eleven minutes (both kidneys). Sodium iodide injected: Left kidney 20 c. c., right kidney 5 c. c. Stereoröntgenograms after the passage of opaque catheters and instillation of opaque fluid into both kidney pelves revealed a ptosis of both organs more marked on the left side. The left pelvis was larger. The superior calices were slightly enlarged with slight irregularities noted. No evidence of inferior calices was noted. The middle and inferior calices appeared normal, but the minor were not visualized. A distinct kinking of the left ureter just below the pelvis was noted. A large area of density was noted on the left side extending from the left diaphragm to the crest of the ileum. This, no doubt, was an enlargement of the spleen.

Examination on October 16th, two days before her death, showed her delirious from inanition. Eye grounds were clear. There were masses of large glands throughout the abdomen and chest, and the liver was large and nodular. Glands were also palpable in the cervical inguinal and axillary regions. The temperature rose to 106° and she died on October 18th, forty-nine days after operation.

On return from the operating room the pulse was 120, respiration 24, and the patient's condition was fair. She did not suffer from postoperative nausea or vomiting. Shock blocks No. 3 were used at the foot of the bed for three days. The extremities were bandaged; a Murphy drip was given continuously for three days. Hypodermoclysis, 1,000 c. c. twice daily for the first two days. The patient complained of cramps at various intervals. On the third day colonic irrigations were given at first. A dark brown fluid and a great deal of flatus was expelled. She was quite comfortable on the fourth day, and improvement was then rapid as far as pain in the back and cramps were concerned. Pain was entirely absent on the fifth day. After operation the temperature rose to 105.2° on the morning of the second day and gradually fell to normal on the fifth day. After this the temperature again arose at various intervals to 101.6°. The pulse after operation rose from 96 to 164 on the second day but gradually came down to normal limits. Respiration varied from 24 to 32.

Medication: Codeine was given. Beginning on the ninth day tincture of digitalis was given. Eserin salicylate at intervals was required. Chloral and bromides at intervals and cascara were also used.

The sutures were removed on the eleventh day and the wound condition was good. On the thirtieth day after operation physical examination disclosed fluid in the left base which was verified by the x ray. A mass was palpable in the epigastrium which was tender and movable. The heart was now normal in size, shape and position but there was a soft blowing systolic murmur at the apex transmitted to the scapular region. The patient was discharged September 30th (thirty days after operation) at her request. At this time she complained of severe pains in the back but not as severe as on admission. She also was disturbed with nausea and vomiting at intake of any food. She was extremely weak and cyanosed. Her bowels were constipated and she would hiccough for hours at a time (irritative). She gradually became worse and was kept under narcotics continually.

PATHOLOGICAL REPORT.

The specimen consisted of a large spleen measuring twenty by eleven cm. and weighing 1090 gms. which was incised longitudinally. The surface was irregularly nodular, the nodules involving the entire surface area except small portions at both poles and the anterior and posterior borders. These nodules were somewhat denser in consistency than the normal splenic tissue and in the areas where there was no splenic tissue intervening they appear yellowish white in color. On the external surface there was an area of hemorrhage beneath the capsule and a raised, dense, yellowish white irregular nodule measuring two by three cm. The gastric surface showed evidence of forcible separation and tearing of the spleen tissue. On section the splenic tissue was seen to be almost completely replaced except for a narrow vein about the periphery by nodular masses of yellowish white tissue which bulged from the cut surface and were more or less incompletely separated by prolongations of splenic tissue extending in from the periphery. In some areas these masses reached the capsule.

Examination of sections of the tumor showed areas to consist of closely packed cells showing no definite structure. The stroma in these areas was scanty or indistinguishable. In other areas the tumor was traversed by delicate or thicker fibrous trabeculæ which in places divided the cells into ill defined alveoli and columns. The tumor cells were for the most part round in shape and of moderate size, being somewhat larger than the large mononuclear leucocytes. They contained a relatively large nucleus, the chromatin of which was arranged in small dots. Most of the cells possessed but a single nucleus, although here and there were multinucleated cells. Mitotic figures were observed in many of the cells. The tumor was well vascularized and showed scattered areas of hemorrhage and necrosis. (Report from the laboratories of the Lenox Hill Hospital.) A pathological diagnosis of sarcoma of the spleen was made (Dr. Priest).

There was a question as to whether the enlarged thyroid was the seat of a sarcomatous lesion, but I feel that inasmuch as she had had this enlargement for several years at the time of her menstrual period, we can rule out that possibility. The intense pain that the patient complained of was probably due to the stretching of the capsule with the vessels and nerves. The first symptoms of recurrence were referable to the gastrointestinal tract. The palpable mass in the epigastrium was probably in the cardiac end of the stomach due to a direct extension by contact at time of operation. The process then followed the lymphatic system and finally through the blood stream which was rather unusual, inasmuch as the circulation is directly through the spleen and liver. With such a rapid spread it is remarkable that the brain escaped metastases.

Giffin (7), of the Mayo Clinic, believes that when a spleen is enlarged and causing pressure symptoms it should be removed. In this case the pain was intense and this alone made its removal justifiable. Also its absence reduces the amount of diseased blood to the liver and relieves the secondary anemia to a certain extent. Giffin has stated the hospital mortality of 245 splenectomies as 10.6 per cent. plus but this is of all varieties of splenomegaly and also some patients died shortly afterward. Naturally in malignancy the mortality is bound to be higher. It is higher in large adherent spleens and where hemorrhage is likely to occur. In the Mayo series mortality was lower in hemolytic jaundice and myelogenous leucemia and high in splenic anemia where the spleen is large and fibrous with the presence of perisplenitis, engorged thrombotic vessels and a difficult operation.

It is to be hoped that with the high development of deep x ray therapy the surgeon's work may be enhanced in the treatment of malignant tumors.

The author's references will appear in his reprints.

Cell Ionization and Its Relation to Malignant Neoplasms*

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The etiology of malignant growths remains the great question before us, the problem which the tremendous amount of investigation in this field still leaves unsolved. The histological picture of malignant neoplasms is well recognized, that the cells comprising such new growths are apparently normal cells which have broken down their supporting membrane and proliferated in an ungoverned manner is the generally accepted belief of most oncologists.

With this condition established and recognized we are forced to ask the following questions: What change in the body, locality, or functioning of a particular organ has brought about such an arrangement of the cells which the pathologist has called carcinoma; what is the factor which has supplied to the formerly normal cells this necessary stimulation for such a histological arrangement and atypical proliferation?

Weighing with care the many inadequate theories emanating from years of research into the etiology of malignancy, has led me to bring forth a hypothesis, that of cell ionization, which seems to answer the principal, pertinent questions in the fields of its pathology and physiological chemistry. Cell ionization here signifies the electric control and direction of cellular metabolism dependent upon the presence of unbalanced positive or negative electric charges in the cellular elements of the tissues involved.

The action of enzymes as applied and related to our subject shall first be considered as it is upon such an action that this hypothesis is based.

ENZYMES OR FERMENTS.

These are primarily catalytic agents, hastening chemical changes without undergoing any change in themselves, nor do they enter into the resultant combination. The reaction of the medium in which the enzymes display their activity is very important; some acting only in an acid medium, others in alkaline or neutral media. The mode of action of the enzyme is specific, i. e., fat splitting enzymes act only upon fats, diastases only upon carbohydrates, and proteolytic enzymes upon albumins. In this paper the enzyme will be regarded as an electrochemical catalytic agent, whose chemical action is exerted by the charge which it carries, and will be considered as a chemical agent composed entirely of positive or negatively charged particles which exert their catalytic influence by the liberation of such particles.

ANTIENZYMES.

Of these socalled antienzymes very little is known and they will be regarded here as chemical agents which influence the action of the enzymes by exerting upon the enzyme or the cell the opposite charge of electricity. Thus if the enzyme is one which acts as a catalyst by the liberation of positively charged particles, the antienzyme will possess a negative charge, and vice versa. In consideration of malignant neoplasms where there exists a more or less characteristic arrangement of the cells, together with accompanying symptoms within the body, it is reasonable to believe that there has occurred within the individual cells some definite alteration before this deviation from the normal occurs and the neoplasm develops. Let us consider at this point some of the conditions that exist in the presence of malignant tumors.

HISTOLOGICAL CONSIDERATIONS.

Upon histological examination of sections for research and diagnosis, we find the most striking and differentiating morphological feature in the study of carcinoma, of atypical proliferation of the epithelium composing it, and from which it was derived. Study has shown us that the parenchymal cells of a carcinoma are all descendants of the cells which gave rise to the neoplasm although there may exist a great diversity of the cells composing such tumors, depending upon pressure, nutrition and functional performance.

CHEMICAL CONSIDERATION.

Urinary changes.—Although no definite diagnosis can be made upon chemical examination of the secretions and body fluids, various workers have found the following changes in the urine in a large percentage of cases: increase in colloidal nitrogen, xanthine, oxyproteic acid, urinary ammonia, urobilin, aminoacid nitrogen, and unoxidized sulphur, while a decrease in urea has been reported by various workers.

Blood changes.—Accompanying carcinoma there usually exists a marked cachexia and anemia, reduction in number of erythrocytes, low hemoglobin index, distinct leucocytosis and greatly diminished alkalescence. Elsberg found that normal red cells injected beneath the skin of persons suffering from carcinoma were rapidly hemolyzed, producing a distinct and characteristic discoloration of the skin. Greene has demonstrated an increase in the nonprotein nitrogen together with an increase of nonoxidized sulphur in the blood of cancer patients.

Changes in gastric content.—Fragments of carcinoma are occasionally found in the stomach washings which, if occurring in solid masses with large nuclei and suitably stained, may be used for diagnostic purposes. However, this consideration is of secondary importance in comparison with other changes occurring in a high percentage of cases of carcinoma of the stomach and intestines. Hypochlorhydria (where the amount of hydrochloric acid is low) or achlorhydria (absence of hydrochloric acid) are very often associated with carcinoma of the stomach. Large amounts of lactic acid in the stomach contents are suggestive of carcinoma.

Before entering into the chemistry involved let us discuss briefly the fundamental composition and functions of the cell components, i. e., nucleus and protoplasm.

The nucleus.—The nucleus, usually occupying a central position in the cell, controls metabolic activities and during mitosis transmits characteristic features (heredity). It consists of a network (chromatin); a semifluid substance which fills in the meshes of the chromatin (achromatin); and a distinct membrane or wall. The chromatin chemically consists of nucleic acid and a basic substance, always some member of the simple proteins, which protein differs, however, in every kind of cell.

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*From the Division of Laboratories, Pennsylvania Department of Health.

The protoplasm.—Protoplasm is a viscid colloidal substance of neutral reaction. Chemically it consists of approximately two thirds water, inorganic salts of calcium, potassium, sodium, phosphorus and oxygen (free or combined). Physically the protoplasm consists of colloids, either liquid (sol), or semisolid (gel) and crystalloids which are electrolytes (bases, acids and salts) or nonelectrolytes (urea, sugar).

The vital spark.—The number of times the question of the origin of the vital spark has arisen is innumerable, yet today we must admit that the answer still remains one of the great mysteries of modern science. With our present knowledge of physical chemistry we know that throughout the entire body there are a series of chemical reactions going on continually and alterations in any one of these accompanying disease manifests itself as diagnostic symptoms for that particular pathological condition. It must also be remembered that these reactions cannot take place without ionization and dissociation of the molecules composing the agents involved. Knowing that our bodies are composed primarily of cells, does it not seem reasonable to believe that any agent disturbing the equilibrium and normal socalled habit chemistry of these cells must be of electrical nature?

It is selfevident that when the normal metabolism or habit chemistry of cells has been disturbed, in so doing they have acquired new structures and functions. It is logical to believe that the necessary stimulus to bring about this change is due in part to a source acting much in the same manner as an enzyme (catalytic agent) and which action is due to the possession of positively charged particles or ions. This electrical stimulus once supplied and the chemical alteration brought about, the cells acquire a new and totally different habit chemistry and continue to grow in this new environment until the source of disturbance is entirely removed or until the normal electric equilibrium is supplied to the original cells (x ray or radium) and normal metabolism is restored. The original stimulus may be due to many sources, all acting in the same manner in a greater or lesser degree, thus determining the rate at which the neoplasm manifests itself.

It has been demonstrated that the action of x ray and radium radiation is upon the cell nucleus (especially upon the dividing cell). A sufficient number of cases of carcinoma developing among the early radiologists warrants an example for the following explanation.

Regardless of the prevailing explanations of the action of radioactive agents, I believe that carcinomata developing among the earlier radiologists was due to the positive rays from the röntgen tube or to the alpha particles of radium which are both electropositive in their action. With the present methods of protection such rays are screened off allowing only the x ray or gamma radiation to be liberated, both of which are light rays having the capacity to break up the atom in their passage through it, liberating negatively charged ionic particles. I believe that such electronegative agents are capable of rehabilitating the normal electrochemical union within the cell nucleus. Due to the short wave length of the positive particles of the röntgen tube and radium, the operator and not the patient was exposed to such an action, resulting in cancer. It does not seem logical to the writer that it was the intense action of x ray and gamma radiation that resulted in cell death with subsequent development of carcinoma. Considering that such an explanation is true and the cells are killed by this intensified action, then how do we account for the predominating characteristic demonstrated in cancer, that of reproduction (cell life). Surely dead cells cannot reproduce. It is obvious that such cases arising among radiologists was not due to a destructive process but rather to one of stimulation which I believe is the action of the electropositive particles, which with great care are now screened off.

Let us grant that x ray and gamma radiation are destructive to all chemical functions of the cell, eliminating such functions and leaving only one property of cell life, propagation. With this condition established, it is readily seen that the life cycle is, through necessity, very much shortened, therefore we could expect a more rapid cell reproduction, which condition does exist in carcinomata, and under its influence the cell acquires and manifests an entirly new and different habit chemistry with its sole property of proliferation, with subsequent infiltration. The functions of cell life are under the influence of such electrical charges, eliminated according to their stability, reproduction being the most stable is the last eliminated.

Where traumatism is considered the etiological factor, we have most probably the same condition in a much modified form, and the most logical explanation seems to be that suggested by Dr. John L. Laird, director of the Pennsylvania State Department of Health Laboratories. Dr. Laird's explanation is that through a disturbance of the trophic nerves, which are supposed to regulate to a great extent the metabolism of the cells, a positive charge is supplied to or exerted upon the cells, thus disturbing their electrochemical union with the subsequent formation of the neoplasm.

Another interesting example is demonstrated in the localities where cancer is most prone to develop. Thus where the reaction is naturally acid (stomach and colon) we have a far greater percentage of cases occurring than where it is alkaline, example, the duodenum.

In consideration of the suggestion herewith presented, let us consider one cell becoming cancergenetic rather than the gross pathology of malignant neoplasms. Hence our first consideration will be that of a normal epithelial cell, working under normal conditions and endowed with its normal metabolism, being continually acted upon by a positive charge, developing into the electrochemically typical cancer cell.

When we consider the physical chemistry of the cell we are forced into consideration of the chemistry of life, inasmuch as our bodies are composed of nothing more nor less than groups of such cells, each, under normal conditions, working in harmony with its neighbor. Although these cells may differ from one another in structure (chemical and histological) and in functions, yet each cell, or group of cells, has its definite and well defined duties to perform.

Cells are endowed with the properties which differentiate the living from the lifeless, i. e., movement, growth, reproduction, respiration and irritability. Under normal conditions these properties form a complete cycle resulting in development and growth of the body, each organ and part being possessed with definite form, structure and duties.

The property of reproduction being of primary importance in consideration of our problem, let us theorize the influence of a positive electrical charge upon cell division. Due to the limitations of space the scheme of amitosis (direct cell division) and mitosis (indirect cell division) will not be described in this paper.

PROLIFERATION AND INFILTRATION.

All oncologists know that the predominating and, with comparatively few exceptions, the only property of cells composing carcinomata is that of proliferation with subsequent infiltration.

Let us consider at this point a group of cells, normal in every respect, being slowly acted upon by an exerting force (positive electrical charge), which would cause changes similar in every detail to those demonstrated in the first stages of karyokinesis. The cell, once stimulated, completes its cycle of division and forms daughter cells, according to the scheme of mitosis, which cells are identical with the mother cell. The force, still exerting its influence, eliminates the period of rest usually following cell division and the daughter cells just formed are immediately compelled to undergo division. Thus it is easily seen that as long as a positive charge exists and stimulating mitosis, that within a comparatively short time we would have a tremendous excess of cells, steadily and rapidly pushing forward, breaking down all bounds of normal retention and growth with the subsequent formation of the neoplasm and infiltration of subjacent tissues.

Now with the continuance of the slow acting positive charge some of the foundation cells acquire a positive charge and act as a nucleus and source of stimulation for the adjacent newly formed cells. The original source of stimulation (traumatism, nerve control, or any condition exerting positive electrical stimulation) acting in connection with the cells in which I believe the normal electrical balance is disturbed and now exert an electropositive reaction, exhausts to some extent their property of proliferation and we get spreading degenerative changes accompanying advanced stages of the disease, that is, after the formation of the neoplasm.

Placing cell metabolism upon the foundation followed throughout this paper (electrochemical) I shall attempt at this point to explain two conditions very frequently observed accompanying advanced stages of carcinoma. Whether or not this bears any true relation to our problem, it at least offers a logical explanation to the conditions under consideration.

The nucleic acid of the normal cell nucleus when functioning properly is electronegative in reaction. The cell receives its nourishment and oxygen from the blood with which it enters into an electrochemical union due to the oxyhemoglobin of the blood, which is electropositive in reaction. Thus under normal conditions we have a direct and active ionization and dissociation of the molecules of the two elements (nucleic acid, electronegative; oxyhemoglobin, electropositive) resulting in the supplying of the proper nourishment to the cell and the breaking up of the oxyhemoglobin with the subsequent liberation of the oxygen, necessary for proper oxidation changes within the cell.

In cancer, however, where both elements (nucleus and oxyhemoglobin) are believed to be electropositive, proper ionization, dissociation, and electrochemical union of the two elements is impossible, with the result that the cells do not receive their proper nourishment and suffer malnutrition (cachexia). At the same time the oxyhemoglobin does not break up, liberating its oxygen, therefore oxidation processes within the cell are greatly diminished, resulting in the accumulation of lactic acid. Likewise many of the blood and urinary changes, to which we shall shortly give consideration, may be due, at least in part, to such an alteration.

In epitheliomata, however, where the superficial structures are generally involved and therefore the action of the positive charge is intensified, we observe proliferation as in other neoplastic conditions and also at an early stage large particles of nucleus are often seen distributed throughout the cytoplasm together with marked hypertrophy of the cells.

This condition I believe to be brought about by the positive charge being so intensified as to cause complete degeneration of the nucleus of the cells, rather than cell division. Therefore, in epithelioma we have first degeneration of the nucleus if exerting force (positive charge) is direct and intensified, which, when degeneration is well advanced but not complete, a certain number of the surrounding normal cells are stimulated to proliferation. When this latter condition develops, and not before, does the real malignant character of the epithelioma manifest itself. With the formation of new cells we have the same proliferation and spreading degenerative conditions as suggested under the discussion on carcinoma.

Malignant tumors are differentiated from benign by the fact that the former possesses the power and property to form metastases which property is not demonstrated by the latter.

It must be remembered that it is not the histological property of the cancer cell that makes possible the classification given above. As stated before, there is no histologically typical cancer call, and this, together with the fact that metastases occur by the proliferation of the cells composing the tumor and not by a spread of cancerous degeneration, forces the suggestion that the property to form metastases must be due to an action similar to the one giving rise to the primary growth. This being the case it is reasonable to believe that at the offset there is no difference between an innocent and a malignant neoplasm, the property of malignancy being gained only through a long continued exposure to the new habit chemistry outlined earlier in this paper. Under these conditions the success of early extirpation or radiation can readily be accounted for.

As stated briefly in a preceding paragraph, the cell nucleus is composed primarily of a network (chromatin). Although this differs in different cells it is composed in all cases of two distinct parts, one an acid part (nucleic acid), the other a basic part (one of the simple proteins). Nucleic acid is composed of three groups, i. e., purine bases, pyrimidine bases and a carbohydrate group. Of these, the former I believe to be the most important, and should therefore be given first consideration.

Before considering these components of the cell nucleus, let us formulate a few facts already considered in order that the chemistry involved may be clearly understood. These conditions, which occur in the order mentioned, are as follows:

1. Checked oxidation causes accumulation of lactic acid.

2. Accumulation of acid causes accumulation of water.

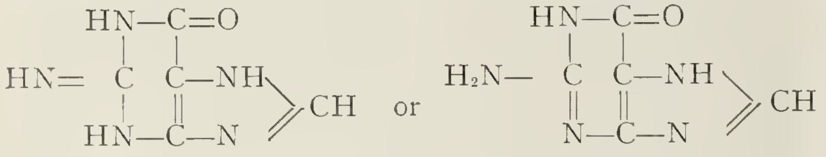
3. Colloids of cytoplasm take up more water in the presence of acids, with subsequent distention and pseudohypertrophy of the cell.

4. Swelling checks oxidation and blood supply.

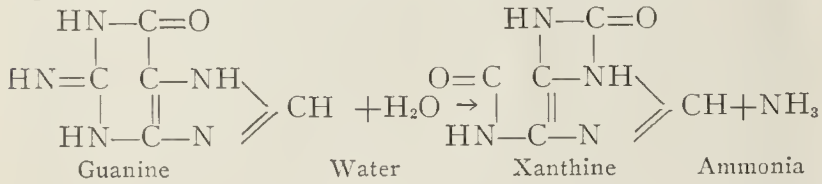
Thus we have a progressive pathological status established, to which the cancer cells adapt themselves. This new metabolism and habit chemistry established, we note the development of characteristic histological and chemical conditions known to accompany carcinomata.

Returning to the chemistry of our problem, Steudel and Levene found that nucleic acid contained two purine bases, adenine and guanine; study of the latter offers very interesting considerations.

Guanine, whose empirical formula is $C_5H_5N_5O$, or 2—imino —6 oxypurine, or 2—amino —6 oxypurine, has a structural formula of either:



Returning to the changes produced by an increase of water within the cell let us attempt to demonstrate a possible chemical change produced therein:



It can be seen from this reaction that the HN of the guanine is replaced by O with the formation of xanthine and the liberation of ammonia (NH_3).

With the increase of water there is swelling of the cell which checks further oxidation, therefore it is reasonable to believe that the oxidation of guanine which normally continues into the formation of urea ($Co(NH_2)_2$) is checked at this point resulting in an excess of xanthine and ammonia in the urine.

In cases of carcinoma of the stomach as well as of other organs, where there is an acid secretion (hydrochloric acid) some of the ammonia enters into combination with the acid secretion and thereby neutralizes some (hypochlorhydria) or all of the free hydrochloric acid of the gastric juice (achlorhydria) with the formation of ammonia chloride (NH_4Cl) which may remain as such or undergo further decomposition.

If oxidation is checked at this point, whereas normally it continues to the formation of urea, we could quite readily account for the decrease of urea demonstrated by many workers. As the proteins comprising the cells contain varying amounts of sulphur, we could, under these conditions, expect an increase in unoxidized sulphur in the blood and urine. This last condition has been demonstrated by Greene.

Up to this point I have endeavored to account for the following conditions observed accompanying malignant neoplasms of epithelial origin: proliferation and infiltration, hypoacidity, increase in lactic acid, increase in xanthine, urinary ammonia, decrease in urea and an increase in unoxidized sulphur. All of the conditions mentioned above have been reported by various workers and form the means of diagnosis in many questionable cases.

There still remain several important subjects for discussion that must await further research. However, experimental and clinical work directed along the lines suggested in this report offers encouraging results and shall form the text of future publications.

CONCLUSIONS.

1. In this hypothesis we have considered enzymes as catalytic agents, exerting their influence by the action of their electric charges and ionization. Antienzymes, on the contrary, we consider to bring about their action by the possession of opposite electrical charges from that possessed by their respective enzyme.

2. Although it is recognized that there does not exist a histological typical cancer cell in this hypothesis we endeavor to show that there does exist an electrochemical typical cancer cell.

3. That with the progressive pathological processes demonstrated in advancing stages of carcinoma there is established a new habit chemistry, under which influence the cell propagates and displays recognized symptoms accompanying the disease, and are formulated as follows:

a. Due to the influence of external cathonic stimuli (positive ray from the röntgen tube, alpha particle of radium, trophic nerves, etc.) the nucleic acid, normally anionic and composing a great portion of the chromatin of the cell nucleus, becomes, upon prolonged exposure, cathonic in reaction.

b. Due to the oxyhemoglobin of the blood being cathonic in reaction ionization and dissociation between these two compounds (cell nucleus and oxyhemoglobin) are inhibited, resulting in decreased oxidation and malnutrition (cachexia) of the cell.

c. Decreased oxidation results in accumulation of lactic acid.

d. With increased acidity the colloids of the cytoplasm take up more water, resulting in distention or pseudohypertrophy of the cell.

e. With increase of water there results a decreased oxidation and checked blood supply.

4. With the formation of the newly established habit chemistry above formulated, we are able to account for the following conditions accompanying the formation and development of carcinomata:

a. Proliferation and infiltration.

b. Excess of lactic acid in gastric contents.

c. Hypochlorhydria and achlorhydria.

d. Increase of unoxidized sulphur in the blood and urine.

e. Increase of xanthine in the urine.

f. Increase of urinary ammonia.

g. Decrease of urea in the urine.

5. If the hypothesis herewith presented bears any relation to the cancer problem, the possibilities of well regulated and early x ray and radium therapy suggest very promising results for the treatment, if not total cure of the disease.

6. I would suggest the possibilities of a treatment of cancer by the administration of protected anionic colloids (negatively charged, passing to the positive pole) due to their rapid and complete ionization, slow elimination, and particularly to their characteristic property of penetrating through the membranous covering of the cell and exerting their direct action upon the cell content. Colloidal sulphur is suggested, since large amounts of this substance can be given, due to its low toxicity and to the fact that large amounts introduced into and around the tumor, should exert a stronger ionizing effect; although the remaining anionic colloids, i. e., arsenic, iodine, silver, lead, mercury, antimony, etc., may be used. When the tumor is so situated that local treatment is impractical, such colloids may be administered per orem. Best results are, however, anticipated in connection with x ray or radium treatment.

7. The beneficial results reported of cuprase (colloidal copper hydroxide) and of colloidal lead, antimony and mercury, recently reported by Blair Bell, of Liverpool University, appear to be clinical application of the suggestion outlined in this report as such preparations are anionic colloids of their respective elements.

It must be remembered that this paper is purely a hypothesis and that I have now under way the tremendous amount of research necessary for its proof or disproof.

Medical Education and Some Medical Views Abroad

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I approach the magnitude of this subject with much diffidence. Considering the vastness of the work which is going on continuously in physiology, chemistry, pathology, and in all branches of medicine, one can give but a cursory survey of a few phases of clinical medicine which are of interest to us, and refer in a general way to the spirit with which medical thought progresses abroad.

Aside from the well organized system of advanced medical teaching one is at once impressed with the character of the medical work in Central Europe. It may be divided into two types: 1, metaphysics of medicine, and, 2, mechanics and physics of medicine. I use the term metaphysics in order to describe the speculative thought, particularly of the inductive type as applied to medicine, dealing with inquiries as to the cause of phenomena and their conception. It is the philosophy which stimulates the interest and imagination and supplies the spark for deeper insight. As in all processes of evolution we see the practical developments taking root and with progress there ripens the finer and subtler type of thought so necessary for the understanding of the mysteries about us. In medicine, too, the law of immunology, the law of heredity, Fisher's conception of the synthesis of proteins, Hamburger's work on osmosis and ions, are all types of inductive thought.

RETICULOENDOTHELIAL SYSTEM.

An important chapter in medicine, of which one hears so much abroad and scarcely anything in our own country, is the reticuloendothelial system or apparatus, a term which was coined by Aschoff and originally called the reticuloendothelial metabolic system. It deals with the intermediary metabolism of hemoglobin, particularly with the production of bilirubin. An increase in its activity causes increased blood destruction. Upon the proper understanding of its function and the aberrations of its function depends the elucidation of the pathogenesis of the hemic diseases, such as pernicious anemia, hemolytic icterus, Banti's disease, and the aplastic anemias, and other conditions such as thrombopenia and scorbutus. The structure of the system consists of endothelial cells forming the capillaries of the portal circulation in the liver known there as the Kupffer cells. They also form the lining of the venous sinuses in the spleen and are also found in the hemolymph glands, in the bone marrow, in the alveoli of the lungs, and in the subcutaneous tissue of the body, known there as the plasma cell and histocytes. The affinity for iron and other colloidal substances of these cells has long been recognized by the followers of Ehrlich and was taken up by Aschoff and later by Eppinger. Eppinger has on numerous occasions injected solutions of organic iron into animals as well as into men just before death and was able to demonstrate, at autopsy, the deposition of the iron in these cells in large abundance. This can be easily demonstrated by the formation of Prussian blue by the reaction of potassium ferricyanide. The interest centred about the function of the recticuloendothelial system has aroused considerable discussion as to whether bilirubin is formed only in the liver or whether the other specialized cells in the spleen, bone marrow, subcutaneous tissue, lymph glands, etc., participate in the production, the liver acting merely as the excretory channel for this pigment.

HEPATOLIENAL DISEASES.

On the basis of the interrelation of the recticuloendothelial system, particularly between the liver and spleen and bone marrow and the hemolymph glands and their dysfunction, Eppinger has created the term hepatolienal diseases, including all the above mentioned diseases plus the degenerative toxic and inflammatory diseases of the liver and spleen such as are met with in the various forms of cirrhosis.

ICTERUS.

The old teaching of Naunyn that the production of all forms of jaundice are dependent solely upon the dysfunction of the liver and that with the extirpation of the liver, as he has done in the Avian species, no jaundice can be produced, this teaching tends to be overthrown in the light of the work done by McNee in Aschoff's laboratory, by the work of Whipple and Hooper, and recently by F. C. Mann of the Mayo clinic. Evidences tend to accumulate more and more that bilirubin is formed outside the liver, as the Eck fistula of Whipple and Hooper and the total extirpation of the liver of dogs by Mann have caused the appearance of jaundice and bile in the urine.

TESTS.

In the latter years numerous tests have been devised for the quantitative estimation of bilirubin in the blood as well as the quantitative estimation of urobilinogen in the feces. The significance of these tests is of great importance in estimating the rate with which blood destruction is going on and also the degree of impaired liver function. When we realize that neither the estimation of the number of red cells to the c.mm. nor the morphological appearances of the erythrocytes can tell us the rate of hematopoiesis or hemolysis which are constantly going on, or as Eppinger calls it the "tempo of blood destruction and blood production," then we see how important it is to study quantitatively the products of metabolism of hemoglobin as only in this way can we ascertain the exact amount of blood destroyed, and thus indirectly know the amount of blood produced? Hijman Vandebergh, of Holland, devised the quantitative colorimetric test for the estimation of bilirubin in the blood. It is a simple test requiring but a half c. c. of serum and will detect minute quantities as far as one to one half million. Normally there are found quantities of bilirubin in the circulating blood from 1 in 400,000 to 1 in 200,000. This test is of particular value in detecting early states of jaundice before the appearance of bile in the urine. Vandebergh found that the threshold of the kidney for bilirubin was 1 in 50,000, that is, there can be an accumulation of bile in the blood four to five times the normal before the pigment will appear in hte urine. Aside from the hemic diseases a slight increase of bilirubin in the blood is found in cholangitis, during and soon after an attack of cholelithiasis, so that it can be employed to advantage in the differential diagnosis between biliary colic and other forms of abdominal colic.

METABOLISM.

The world war has supplied considerable information as to the necessary requirements for the maintenance of a normal man in a nitrogenous equilibrium and the caloric needs per diem. The old standards of Voit and Rubner of 3,500 calories for a man weighing 70 kilograms were completely overthrown. During the war the food rations became gradually reduced to 800 calories as a minimum up to 1,500 calories as the maximum for a hard working man, that is, between 20 and 25 calories to the kilogram of body weight. The following changes, however, were noticed. A man weighing 70 kilograms in 1914 became reduced in weight to 55 kilograms in 1918, that is, there took place a gradual reduction of 2.25 per cent. of total body weight each year. These were the uniform findings both in Germany and Austria. Curious enough at this stage the body adjusted itself to this low intake so that there was no further loss of body weight, neither was there any interference in the performance of daily tasks. It is believed that the endocrines were responsible for this adjustment, causing the metabolic rates to take place at a lower level.

DIABETES.

Valuable information was also obtained as to the influence of this low food ration on diabetes mellitus. Statistics have shown that diabetes practically disappeared during the war. The patients became sugar free, their carbohydrate tolerance became markedly increased, they gained in strength and weight, and were able to resume active work. These effects, noted both in Germany and in Austria, were due chiefly to the diminution of the protein food, meats becoming scarcer and scarcer early in the war.

Falta has called attention to the fact that each hundred grams of protein metabolized yields in the process of combustion eighty per cent. carbohydrates; that for each gram of nitrogen metabolized five grams of carbohydrates are likewise metabolized from the same protein molecule. Therefore, in the establishment of a sugar tolerance one must never lose sight of the large amount of sugar derived from the proteins. One must also consider the type of protein, whether animal or vegetable, the animal protein being more dangerous than the vegetable, in view of its rapid assimilation and metabolism, the vegetable protein requiring a much longer time for its utilization thus providing an opportunity for the combustion of the carbohydrates.

The treatment of diabetes in vogue at the present time is the *Mehlfruchtenkur* or the cereal soup cure (based upon the original oatmeal cure of Noorden) or a combination of cereal and vegetable soups. Contrary to Allen and Joslin they maintain their patients on a higher caloric food value. They starve their patients very seldom, resorting to the fast days under rare conditions of acidosis. Their conception of acidosis differs somewhat from ours, inasmuch as they attribute the disturbed fat metabolism and the production of the ketone bodies, not only to the inability of the carbohydrates to be metabolized, but particularly to the presence of the proteins. Falta, who has perhaps done most of his work abroad, speaks of the protein as *l'agent provocateur,* the provocative agent that is responsible for the production of the ketosis. I have myself seen in the Falta clinic at Elizabeth Hospital a number of patients with acidosis where the fats were not withdrawn neither during the acidosis nor during the starvation period. The proteins were rigidly withdrawn while the patient continued on 150-200 gm. of fat a day in addition to Falta's cereal soups. I have seen no ill results. On the contrary the patients continued to improve, the acidosis disappearing and in time the sugar tolerance increasing with a gain in weight and in some cases restoration to health.

ENDOCRINOLOGY.

While the Germans are given to speculative thought, as a rule, it is surprising to see with how much caution and common sense they approach this subject. It seems that some of us in this country have allowed ourselves to run into fantastic speculation, attributing to endocrine dysfunctions almost every ailment to which human flesh is heir.

Working under tremendous difficulties on account of the high cost of apparatus for metabolic determinations, etc., their work can be compared quite favorably with the scientific investigations of Plummer and Boothby and also DuBois, Cushing and their coworkers.

Recently Zondeck, a young man connected with the Charité, has done some remarkable experimentation revealing the biological action of the endocrine to be dependent upon the balance of the ionic components chiefly of calcium, potassium, sodium and magnesium. He could produce either inhibition or stimulation of a strip of cardiac muscle, which effects were similar to a vagotonic or sympaticotonic reaction, when the cardiac muscle was kept oxygenated and transfused with the different ions of sodium, potassium, calcium or magnesium, the sodium and potassium having an inhibitory action, similar to a vagus effect, whereas the calcium and magnesium produced a stimulating effect similar to adrenalin and thyroid. He deduces from this that nerve reactions are dependent upon the equilibrium between these various ionic concentrations. Remarkable results can be attained clinically in all vagotonics by the intravenous injection of calcium chloride.

As to the treatment of Basedow's disease they also recognize the medical, röntgen ray, and surgical modes of treatment. X ray therapy in this disease has fallen somewhat in disrepute and is considered only mildly palliative. As to the etiology of Basedow's disease they regard it, not as a thyroid toxicosis, but as a dysthyroidism where there is the production of an abnormal secretion and not an increase of normal thyroid secretion. This hypothesis is utilized in the treatment of the disease by the use of homeopathic doses of iodides in the attempt to stimulate the remaining normal thyroid cells to counteract the dysfunction and produce a normal secretion. I myself have seen beneficial effects from this form of therapy, where the patients gain in weight steadily.

Interesting observations have been made as to the cardiac measurements in myxedematous states. The heart appears enormously enlarged in all its diameters, contracting very flabbily, at the same time the electrocardiograph showing an absence of the P. and T. waves and the venous pulse on the absence of the C wave. These conditions promptly disappear under thyroid medication, the heart often decreasing to one half its previous size.

The Steinach operation is very popular in Vienna but is regarded with disfavor in Berlin, and in many other things the Viennese and the German schools differ. For instance, during the many months that I spent in Berlin I never heard Freud's name mentioned either in or out of the university. As to the Steinach operation, it appears that for the first six months to one year miraculous results of rejuvenation can be brought about. Old men experience the stage of adolescence of a boy of eighteen. This experience, however, appears to be shortlived and is followed later by a period of depression which is far worse than the previous state. This is the German view. The operation has not been accepted in Germany and it is not advocated.

KIDNEY.

As to the status of kidney pathology, the clinical subdivisions or groupings seem to hold sway over the pathological classifications. In certain quarters, particularly by the pathologists of the Charité, there is an attempt made to smooth out the differences and to correlate the clinical and pathological findings. Roughly the present clinical subdivisions are recognized.

1. The degenerative types or the nephroses, such as are encountered in syphilis, tuberculous toxemia, febrile states, toxic states, diphtheria, pneumonia, influenza, mercury poisoning, etc. Here one finds the presence of lipoids in the urine which may be due either to a disturbed lipoid metabolism or to a lipoid degeneration of the renal epithelium.

2. The acute nephritis, more correctly designated as a glomerulitis, characterized by a primary inflammatory lesion in the glomerulus with secondary changes in the renal tubules, in view of the anatomical circulatory relation between the vas deferens of the glomerulus, to the tubule. These nephritides are found in many of the acute infectious diseases and in septic processes arising often from other infected foci. The war has shown that even pediculosis with infected scratch marks often results in the most severe glomerulitis. The involvement of the glomerulus may be diffuse, or it may be focal or embolic, or it may be unilateral and can then be mistaken for a surgical kidney due to unilateral hematuria.

3. Chronic nephritis or the secondary contracted kidney—a sequel of the acute glomerulitis.

4. The arteriosclerotic kidney which is divided into two classes: a, benign, and, b, malignant.

In the first only the larger renal vessels are involved and in the second the arteriosclerosis process extends into these smaller vessels and is called the arteriolosclerotic kidney.

5. Suppurative types: a, ascending; b, descending or hematogenous.

KIDNEY FUNCTION TESTS.

As regards the interpretation of kidney function, Europeans, the English school as well as the German, differ from us in the use of phenolsulphonephthalein. They do not advocate the employment of a foreign substance to test out the work of the kidney, but recommend the employment of substances which the kidney is called upon to excrete in the performance of its daily physiological activity. These substances are particularly water, salt and urea. The English recommend urea especially. Phenolsulphonephthalein is not employed at all. The English attempted its use for a while but discarded it in view of the lack of uniformity of results with their preparation. For surgical examinations indigocarmine is used.

The utilization of water as a kidney function test was originated by Schlayer and later modified by Volhard. In this country it was first used by Mosenthal and modified. It is known today as the Mosenthal test. The method as employed abroad consists of the administration of 1,500 c. c. of plain or aerated water on a fasting stomach and the urine collected every half hour for four hours. Normally it is found that eighty-five per cent. of the fluid is eliminated between two to four hours, the specific gravity sinking quickly to 1.000 and towards the end of the test returning to the normal. This is the socalled dilution test. The concentration test is carried out the following day and consists of the administration of solid foods only, withdrawing all liquids, and the specific gravity of the urine taken at each voiding. In the normal kidney the amounts are small and the specific gravity rises to 1.030 and over. The abnormal kidney can neither dilute nor concentrate, the volume, the specific gravity and the rate of elimination remaining unaltered under all conditions with but slight variations, depending upon the severity of the involvement. The socalled hyposthenuria and fixation become apparent.

Falta has conceived a subtler test for kidney function in the use of the potassium salts, administering 1,500 c. c. of normal potassium chloride solution. The test depends upon the principle of dehydration of the potassium ion. He found that when he gave to a normal man on a fasting stomach 1,500 c. c. of a normal sodium chloride solution, the water would be retained up to almost fifty per cent., contrary to the administration of plain water, where eighty-five per cent. would be eliminated within two to four hours. When, however, he substituted the potassium for the sodium salts he found that a normal man would eliminate 1,700 c. c. of water, that is, several hundred c. c. more than the intake. The effect of the potassium ion is to cause an osmosis of the fluids from the subcutaneous tissues into the blood, thus producing a hydremia, which is followed in the normal kidney by diuresis. If the kidney function is deficient, however, the amount of fluids excreted will remain constant and retain its low level irrespective of the hydremic state. It is thus seen that the contrast will be greater and the test more delicate.

EDEMA.

Important studies on edema were made by Eppinger. His observations on myomalacia cordis led him to a series of important scientific investigations. He found, in postmortem examinations, definite pathological changes in the thyroid gland similar to those present in myxedema. He noticed in all these cases that the patients had presented during life a low basal metabolism and continued to have a low consumption of oxygen even after the disappearance of the edema. He also noticed the beneficial effect of thyroid administration. These facts led him to conduct a series of experiments on dogs in which he studied the rates of absorption and elimination of water and sodium chloride in the normal dog and in thyroidectomized dogs. He made fistulas in the dogs' bladders and found that eighty per cent. of the water administered was eliminated in the normal dog within one hour, and in the thyroidectomized dog there was a marked delay. The same results in the delay of elimination were noticed with sodium chloride. He conducted these same experiments in patients suffering from myxedema and Basedow's disease and found similar variations in the elimination of water and salts. Furthermore, subcutaneous injections of sodium chloride solutions would remain indefinitely beneath the skin in the thyroidectomized dogs. He made similar observations on the absorption of saline from the skin by the aid of the plethysmograph in myxedematous and in Basedow patients. The results were always similar. He carried these observations further to patients suffering from nephroses and found a low basal metabolism and similar lack of absorption of water and salts as observed with the plethysmograph. It is then that he established the relation between nephroses and the thyroid gland, the extrarenal component in the nephroses.

His experiments on the mobilization of sodium chloride and water revealed that the skin was the natural or physiological storage house for salt and to a less extent for the water, and that if twenty grams of sodium chloride were administered it would first be deposited in the skin but not in the internal organs and that it would require at least twenty-four hours for its elimination. The potassium salts are not deposited in the skin but in the internal organs, in the skeletal muscles, the heart, the brain, etc. In the heart the potassium content is very high normally. In those patients dying of cardiac insufficiency in waterlogged states he found a diminution of potassium and a replacement with excessive deposits of sodium in the interstices of the heart muscle and edema. He advises strongly the administration of potassium salts in large doses in all these cases before any cardiac stimulants are administered.

In the edemas of nephroses and nephritides the lack of elimination of sodium chloride and water is not due to the lack of kidney elimination but to the changes in the peripheral capillaries which are analogous to the changes in the glomeruli and in the renal epithelium. The increased permeability in these capillaries for albumin is the cause, in Eppinger's opinion, of the production of the edema. Similar changes he finds in pulmonary edema, where the alveolar capillaries allow the passage of albumin and water into the lungs. Similarly one finds in edema of the brain in inflammatory states the presence of albumin in the cerebrospinal fluid. In his experiments with the dialyzable membrane, if one adds albumin to the solution of sodium chloride, the sodium chloride will promptly cease to pass out. On the other hand, if one adds trypsin and the albumin undergoes digestion, the sodium chloride will then again begin to dialyze. The thyroid extract causes an improvement in the metabolism of the albumin and therefore controls the edema. In his opinion diuretics act, not by causing an increased hydremia and not directly as stimulants of the renal epithelium.

RÖNTGEN RAY.

Fluoroscopy is used abroad to far greater advantage than in the United States. It has always been preferred to plates even before the war when the question of expense did not exist. It is remarkable to what finesse they have developed the art of fluoroscopy and with what diagnostic acumen they recognize any aberration from the normal. All their diagnoses are reached by the fluoroscope. It is seldom that plates are used. Occasionally they take a plate of the stomach, but it is more for exhibition in the clinic and for the record than it is for diagnosis. Most of their records are kept by sketches and tracings over the fluoroscopic screen which, by the way, is made use of in every single case. Cardiac measurements are ascertained, pleural effusions, tumors of the lung, aneurysms, tuberculous infiltrations, are all traced and observed from time to time, comparing the various tracings as to the progress of the disease. Tracings are attached to each patient's chart, another set of tracings remaining in the laboratory for record. The fluoroscopist of the institution does nothing but fluoroscopy and remains in the dark room from morning till night, using remarkably little protection. I have seldom seen gloves used, not to mention rubber aprons and lead glasses. As to their plate work, it is much inferior to ours. They seem to have stood still in the technic of röntgen plates and they are at least fifteen years behind. Films are unknown, glass plates being still used. Many of the plates are nondiagnostic and would not be used in our institutions, to say nothing of our private practice. Their technic is poor, almost all their lung plates blurring of respiration. As to the accuracy of diagnoses, Haudek has told me of a number of occasions where he diagnosed the presence of a gastric ulcer which the surgeon could not find upon opening the abdomen. Haudek, however, persisted as to its presence and indicated the exact location, and upon the strength of his word many times a pylorectomy and even a gastrectomy have been performed; the pathologist invariably finding the niche in the resected portion.

PATHOLOGY.

Virchow's cellular pathology still holds sway in Central Europe, although undercurrents of skepticism are apparent as to the explanation of all phenomena of aberration of function upon structural cellular changes. Lubarsch in his studies of a series of cases of achylia gastrica of a functional nature was unable to discern postmortem any alteration in the morphology or staining characteristics of the goblet or parietal cells of the stomach. Similarly Dresel working at the Charité on the autonomic nervous system was able to produce glycosuria in animals by *piqûre* of the corpus striatum at the nucleus pallidus. Under prolonged glycosuria the islands of Langerhans of the pancreas showed no structural changes.

We in this country and the English having their chief exponent in Mackenzie recognize more the importance of function and its lack of dependence from structural cellular changes. When we consider the rôle played by the body fluids, the hydrogen ion concentration, surface tension, and the extracellular immune bodies found in disease; and when we consider the secretions, enzymes and hormones and their far-reaching influences, the entire subject of physical chemistry with the innumerable interchanges and reactions continuously taking place, upon which life depends, we can then understand the importance of function both in health or disease. When we further consider the influence of constitution and the status and how these may modify function without any alteration of cellular structure, we then have a fair picture of the significance of function and its independence of cellular pathology.

FACILITIES FOR WORK.

As to the facilities for work abroad I wish to say that in Central Europe one finds a well organized system of medical instruction, most efficiently carried out in Vienna. Their organization consists of a body of splendid teachers, a group of men representing all branches of medicine who love to teach and who have made teaching their life work. Most of these men are gifted in the art of teaching and can give courses in three or four foreign languages, English, French, Spanish, and Italian. Most of them speak English fluently.

I need not dwell upon the abundance of the material and the rich clinics when we consider that the Allgemeine Krankenhaus in Vienna has six thousand beds from which to draw upon for study. I shall perhaps mention the type of the available material which is of great interest. Their public patients differ a great deal from our own, inasmuch as each individual patient feels that he must offer himself as an object for study. We treat our patients more humanely, with courtesy and consideration. Our patients expect this attention. Not so on the other side. Our patients would not submit so readily to the many tiresome examinations. I had occasion to witness a case where a patient was brought down to the eye clinic only a few days following a laparotomy for gastric ulcer, because he presented an interesting eye fundus.

PHYSICAL DIAGNOSIS.

Among other things it was refreshing to see with how much precision they applied themselves to physical diagnosis. It was astonishing to see how accurately they percussed cardiac borders and how well they corresponded with the fluoroscopic tracings. It is still a vital and important art, for unlike the stethoscope one does not carry a fluoroscope in his pocket.

As to pathological material one has the opportunity to study the material of ten autopsies a day. I need not mention the exactness and the detail with which these cases are presented. All the important data with their previous records are brought forth and the pathological findings are presented grossly and microscopically by the aid of projectoscopes, frozen sections being prepared the same day for the class.

With all this, however, I feel that America is destined to become in time the leading centre of medical education. From the perspective we can appreciate our own country better. In the mechanics and physics of medicine today we lead the world. Our surgical technic is surpassed by none. In the great field of physical chemistry such names as Gibbs, MacClandan, Loeb, VanSlyke, Folin, and Benedict stand out preeminently all over the world. In this prolific field of research, which bids fair to equal in importance that of the discovery of germs, we are no longer followers but leaders.

The two main obstacles that confront us at the present time are the lack of full time competent teachers and the lack of sufficient autopsy material for pathological work. In the first, our philanthropists should come to the rescue in establishing adequate funds for the encouragement of full time teachers, and as to the second, the laws should assist us in obtaining the necessary material.

In conclusion, one cannot fail to be impressed by the splendid group of men abroad. In Germany, Aschoff, Friederich Müller, Kraus, Hiss, Goldscheider, Brugsch, Bickel, Umber, Assman, Frankel, Minkofsky and a host of others. In Vienna, Chvosteck, Ortner, Wenkebach, Holzknecht, Haudek, Eppinger, Falta, Kovach, Erdheim, Hess, Freud, and Eiselsberg. One cannot but admire their sincere devotion and how stoically they stand the sacrifices under the stress of the times. When we consider that most of these are full time men with a fixed salary from the government equivalent in our money to eight or ten dollars a month, but a half to a third of the salaries of the working people, we can then realize their plight. To see a man like Eppinger, who to my mind is today the greatest medical thinker of Europe, to see this genius running from the ward to the research laboratory and then to the teaching class and from there to the autopsy room and then again into the fluoroscopy room, snatching a black bread sandwich in between, is both an exalted and a pitiful sight to see. Let us rise to their rescue. As H. G. Wells remarked in 1919 after his visit to Soviet Russia, "Scientists and artists have a mission to fulfill, each one in the performance of his specialized work. Unlike the laborer they cannot assume any type of work as the emergency of the times may call for. Deprive them of their work and they die." Therein lies the explanation of the unceasing and unselfish devotion to their work. They have their mission to perform. Deprive them of it and they perish.

110 East Sixty-fourth Street.

A Gravity Method of Blood Transfusion*

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All is not well at the present moment with the art of blood transfusion. Carrel states flatly (1) that the piston methods of transfusion are wrong in principle, and must, in the long run, prove dangerous in practice. Almost simultaneously Bernheim (2) and more recently Unger (3) have published papers showing that there is an increased morbidity and an increased mortality when the citrate method is used, as compared with the methods which transfuse uncitrated blood. Thus from high authority come criticisms of the two methods which in this city are used almost exclusively,—criticisms so severe that it is scarcely likely that either of these now popular procedures can remain much longer the method of election in the best hospitals, however long they may survive in military and rural practice, and in cases where special indications must be met. This statement will certainly not pass unchallenged by the exponents of the present methods. I expect but little support from the leading workers in this field, because each is the father of his own particular method, and is bound by the rules of parenthood to support his own child.

Before discussing the good and bad qualities of the different methods of transfusion, let us briefly consider some important characteristics of blood. This fluid tissue, for it is no less, consists of myriads of living corpuscles, themselves exceedingly fragile and prone to disintegrate upon slight trauma, which float in a plasma that tends to undergo remarkable physicochemical changes with great rapidity. Thus for physical delicacy and chemical instability the blood is without any parallel in nature.

For the present, we may consider only the phenomena that constitute or accompany coagulation. Blood remains fluid as long as it is contained in living and healthy vessels, and as long as it does not touch any foreign body or clot inducing substance. However, when the blood is shed, changes are usually instituted which lead to the formation of a coagulum within three to ten minutes. For our purpose it is not necessary to review the vast literature of clot formation, nor to learn the complex theories of the interaction of cellular elements, thrombokinase, calcium salts, thrombogen, thrombin, fibrinogen, and the endproduct, fibrin. Suffice it to say that when the blood touches any substance that it is capable of wetting, e. g., steel, glass, paper, or rubber, it clots rapidly. This does not happen for a long time if the blood, when shed, is received in a vessel lined with a substance that cannot be moistened by the blood,—a blood repelling substance like paraffin or petrolatum. Apparently any substance that is wet by the blood exerts a traumatic or destructive action on the formed elements, notably the platelets, which at once give off clot forming or thromboplastic substances. Even then, if calcium salts are not present in the plasma in available form, no coagulation can occur. These characteristics are important to the worker in transfusion for several reasons. Massive coagulation at any stage of transfusion mechanically stops the operation. Also, the introduction of clots, even if small enough to pass through the needle, into the recipient's vein, constitutes a grave danger. Furthermore, there is evidence that the reactions that follow transfusions are in many cases due to changes in the blood antecedent to clotting.

Let us take up the advantages and drawbacks of the various methods of transfusion.

1. Direct transfusion by arteriovenous anastomosis. This is one of the oldest methods. The radial artery of the donor is exposed for two inches, and a vein of the recipient is exposed for an inch. The artery is divided, and the vein is incised. The proximal end of the artery, from which the blood is spurting, is inserted into the vein about an inch. In order to estimate the quantity of blood transfused, the operator, before inserting the artery into the vein, may receive a certain number of spurts of blood in a measuring glass. Experience has shown, however, that this mode of measuring the blood is grossly inaccurate. This ancient method transfers a pure, unaltered blood. In this respect it stands first of all methods. However, it has fallen into disuse because it inflicts a painful dissection upon both donor and recipient, it destroys the donor's radial artery, and it provides no accurate measure of the quantity of blood transfused.

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*Read before the Bronx Medical Association, February 1, 1922.

2. The paraffined bottle of Kimpton and Brown. This method consists in the reception of the blood in a paraffin lined bottle or flask. Venous blood is used,—a great advance over the older methods which destroyed an artery. The Kimpton-Brown method is good in that the blood touches only paraffined surfaces, and may be transported a short distance if necessary. The disadvantages are that the method is not always successful, since clotting sometimes takes place before the completion of the transfusion, and that the blood, in any case, is about fifteen minutes outside the human vessels. No man knows what changes may take place in that magic fluid in fifteen minutes. In the method that I use, the blood is out of the human vessels only about one second, while traversing a seven inch tube.

3. The piston methods. The late Edward Lindeman described a "simple syringe transfusion with special cannulas." His plan was indeed simple in conception, as he merely withdrew blood with a piston syringe from a vein of the donor, and injected it into a vein of the recipient. However, in order to transfuse a sufficient volume of blood, six hundred c.c. or more, the operator was obliged to fill and empty his syringe many times. Lindeman insisted that the syringe must be washed after being used, before being refilled. An assistant was required for this part of the work. It was necessary also for one operator to withdraw blood from the donor's vein while another injected blood into the recipient's vein. Thus the transfusion required three skilled workers who could operate in perfect synchronism. Unger, Bernheim, and many others sought to simplify Lindeman's method. They did indeed save labor by omitting or reducing the frequency of rinsing of the syringe, and by substituting a rotary valve or plug for the troublesome method of connecting and disconnecting the cannulas. Lindeman's method and its modifications have the advantage that they keep the blood out of the veins only about seven to ten seconds.

The disadvantages of Lindeman's method are: It is laborious and calls for perfect teamwork; much blood is lost at the donor's cannula; contamination of donor's cannula with recipient's blood may occur; the cannulas are not paraffin coated, though they are coated with albolene (it is doubtful that albolene remains in the cannula when washed with warm blood); the blood is subjected to at least four forms of trauma, i.e. it is churned by manual power through the inordinately small nozzle of the Record syringe, while in the glass cylinder it is subjected to violent changes of pressure, some of the formed elements are triturated between the piston and the wall of the cylinder, and mere contact with the bare glass of the cylinder causes trauma of the platelets, with setting free of thromboplastic substances. Lindeman was aware that the blood suffered trauma in the syringe, and to minimize this danger, he insisted on incessant washing with sterile water. But Bernheim, in describing his modification of the method, speaks of refilling a syringe two or three times before washing, and Unger goes a step farther and uses a syringe repeatedly until the transfusion is completed. Each of these instruments is a veritable mortar and pestle. It will be urged that only a few cells are caught between piston and cylinder. This is doubtless true, yet a few are sufficient to give up enough thromboplastic substance to incite clotting.

4. The sodium citrate method. This method, matchless in its ease and simplicity, merely requires the addition of 0.25 per cent. sodium citrate to the blood as it is received in a flask or other vessel. Once citrated, the blood will remain fluid for two days or more so that even the novice will have time to inject it into the recipient. The method, introduced independently in 1915 by Lewisohn of New York and Agote of Buenos Ayres, at once attained great popularity. Almost immediately, however, it was noticed that chills and high temperature followed citrate transfusions far oftener than pure blood transfusions. At first it was thought that these reactions were devoid of real danger. However, after about six years' experience with the method, operators began to report fatalities, some of which occurred long ago. The method is still widely used, but evidence is accumulating that it is not so safe as the methods which transfuse uncitrated blood. The paper read by Bernheim (2) at Boston last June, and the important discussion which followed, showed that the profession is now aware of the risks of the citrate method. Yet, as Lewisohn said at that time, our object should be, not to abolish the use of the citrate method, but to divest it of its dangerous feaures. The socalled citrate reaction occurs in about twenty per cent. of the cases in which blood is transfused by the citrate method. A similar reaction occurs in about five per cent. of the recipients of uncitrated blood. It is possible that the same cause is present in both instances. Possibly trauma of the formed elements, which undoubtedly occurs in marked degree with the citrate method, is the cause of the reactions. This trauma may be in part avoided by the use of paraffin lined vessels, tubing, and needles, in connection with the citrate method.

5. The gravity method of transfusion. Last summer I asked Dr. Carrel what method of transfusion he considered the best. He replied that of the methods used today, none was satisfactory in principle. That a procedure should be perfected by which the blood could be transfused from the vein of the donor to that of the recipient through a tube which would not allow coagulation; at the same time, a device should be made to measure the amount of blood transfused. (During the war, Dr. Carrel performed transfusions with a simple vein to vein paraffined silver tube. However he had no exact measure of the amount of blood transfused.) Subsequently to this conversation, a friend (Dr. Clarence Smith) suggested that the donor be weighed before and after the transfusion. Upon this hint I based the gravity method. However, the donor is not weighed before and after,—on the contrary, the donor, or better, the recipient, is on the scale during the transfusion.

Apparatus used. A platform scale, capacity three hundred pounds, sensitive to variations of one quarter ounce. The scale I use is a Fairbanks silk scale. No clinical scale and no automatic scale of this capacity would be sensitive to one fourth of an ounce. The scale mentioned is a result of the demand of the silk trade for a weighing instrument of large capacity and extreme accuracy. It is portable. I had the beam cut by the makers with metric graduations. Otherwise it is a stock scale. Its accuracy is remarkable.

Two wooden tables, eighteen inches wide, eighty inches long. The donor's table is thirty-two inches high, the recipient's table is of such height that when it is in position on the scale platform, it will be six inches lower than the donor's table. This difference in level augments the flow of blood from donor to recipient. The tables fold and are portable.

Two arm rests. In each case this is a thin oak board about three and one half inches wide. The recipient's arm rest is straight, as it is used in a horizontal position. The donor's arm rest bends sharply downward from the edge of the donor's table, at an angle of forty-five degrees.

The tourniquets should be red rubber tubing, one quarter inch diameter, eighteen inches long.

The blood carrying tube is pure gum five-thirty-seconds of an inch inside diameter, seven-thirty-seconds of an inch outside, seven inches long. At each end is an adapter for attachment to a Fordyce needle. Most adapters have a small lumen, and should be drilled to a diameter of one eighth inch.

The needles are Fordyce needles No. 12, 13, and 14 (English wire gauge). The 13 gauge is generally the best. For children a 16 gauge needle is suitable. A hot mixture of paraffin and petrolatum, fifty per cent. each, is drawn through each blood tube and each needle, after which they are sterilized by steam in a vertical position, examined for patency, and resterilized.

TECHNIC.

Both arms of both patients are inspected, as either arm of either patient may be used. The recipient lies on his table on the scale platform. His chosen arm is placed upon his arm rest, which extends horizontally toward the donor's table, all contact being avoided by the difference in level of the tables. If the umbilicus of the recipient is over the center of the scale platform, he will be sufficiently well balanced for accurate weighing. The donor lies on his table, which is about eighteen inches from the recipient's table. The donor's arm is on his arm rest, which inclines sharply downward, so that the median basilic vein of the donor is close to that of the recipient. A space of half an inch is maintained between the arms of the two patients. The recipient is weighed, and if necessary, a small additional weight is placed on the scale platform, so that the beam will balance with the poise close to the zero mark on the beam. If the poise then happens to be at the 20 G mark, and it is desired to transfuse 600 G, the final resting-place of the poise will be at 620 G. This end point should be decided upon, but the poise need not be placed there at once. Tourniquets are applied to the arms of both patients, the donor's tourniquet, especially, being snugly placed. The fields are sterilized with iodine. The operator now introduces a 13 gauge Fordyce needle into the vein of the recipient, and at once the nurse releases the recipient's tourniquet and removes it. A spurt of blood, followed by a steady flow, should mark a successful entry of the recipient's vein. If the puncture of this vein is satisfactory, the operator at once introduces another 13 gauge Fordyce needle, attached to the rubber blood carrying tube, into the vein of the donor. While the blood is flowing in good volume from the tube, it is quickly attached to the recipient's needle. The transfusion now proceeds automatically. The nurse follows the rate of flow by shifting the poise on the scalebeam. If for any reason the flow should cease, the scalebeam would cease to rise. With good veins and a successful puncture, the flow is very constant, and the beam tends to rise steadily until the nurse has gradually pushed the poise out to the point which has been decided upon as the endpoint. When the poise is at this point, and the beam is balanced, the transfusion has been completed. The operator then compresses the rubber bloodtube to stop the flow. At the same time he releases the donor's tourniquet. While still compressing the tube, the operator withdraws both needles from the veins, and elevates the arms of both patients to prevent bleeding from the little needle wounds. Sterile compresses are applied, and the arms may be brought down after about three minutes.

Use of this method in hospital and private cases convinces me that, 1, in transfusions in which donor and recipient have welldeveloped veins, the method is astonishingly easy; 2, in cases where one or both of the patients have veins that will barely admit a 14 gauge needle, the method may be used by a skilled intravenous worker without any great trouble, but the novice will fail; 3, in difficult cases, where the veins are exceedingly small, or have been thrombosed or infiltrated by arsphenamin, the method, like all pure blood methods, can be employed only by an intravenous worker of rare skill. Even if such an operator be available, it is better, in my opinion, in the face of such formidable difficulties, to use the paraffin-citrate method already referred to, in which the blood is citrated, but is kept in a paraffin lined container, and is received and delivered through paraffin lined needles and tubes.

The gravity method calls for rather bulky apparatus. However, in an emergency, everything may be dispensed with, except the tube and two needles, paraffined and sterilized, and two tourniquets. In such a case, the amount of blood transfused would be judged by effect upon the recipient.

In the use of a simple vein to vein paraffined tube, I assert no priority, since other workers, notably Carrel, have used such a tube. They, however, had no means of measuring the flow, except the laborious and at times very inaccurate method of Libman and Ottenberg.

I would repeat that patients whose veins, on inspection, are found to be very small (smaller than a 14 gauge needle) are not eligible for the gravity method, because the gentleness of the propulsive force employed, precludes the use of fine needles.

Sixty to seventy-five per cent. of all cases are eligible for the gravity method, and ought, in my opinion, to receive the advantage it offers.

The author's references will appear in his reprints.

Miliary Carcinosis*

By ELMER H. FUNK, M.D.,
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Metastatic malignant disease of the type exemplified by the present case is so uncommon that we believe it worthy of recording.

CASE.—E. A., K-2306, female, white, aged twenty-eight years, was admitted to the department for diseases of the chest of the Jefferson Hospital, September 15, 1921, and died September 20, 1921. Her family history was negative. She had had measles and pertussis in childhood, influenza in 1918, and some mental disturbances in the summer of 1919, for which she was a patient in the Philadelphia General Hospital for four months. She recovered entirely from this trouble. An abdominal section was performed in February, 1920, for tuberculous peritonitis, and at operation an ovarian cyst was found and removed. Menses were normal. She had four children living and well.

Her present illness began on July 4, 1921. The patient was seized, after exposure to wet, with a sharp pain in the right side, aggravated by deep breathing and associated with a dry cough. The pain lasted for two weeks, during which time the cough became worse and slightly productive. Shortly afterward attacks of sweating occurred and were associated with progressive weakness. Early in the course of the illness shortness of breath developed. It was slight at first but increased in severity until she was compelled to go to bed on account of this symptom as much as for the distressing cough and weakness.

Condition on admission.—When admitted to the hospital she was quite weak, dyspneic, cyanotic, feverish, and distressed by a frequent hacking cough. At times this cough was productive of a considerable amount of yellowish sputum which on one occasion was bloodtinged. She had no pain. Emaciation was marked and her relatives told us that she had lost a great deal of weight since the onset of the illness. She had weighed 146 pounds in 1913 and this was about her average weight before the present illness. Her last weight, about two weeks before admission, was 111 pounds. She was so sick upon admission that it was not possible to weigh her. The physical examination revealed a pallid conjunctiva, pupils equal and reacting normally, ocular movements normal, ears normal, tongue coated with a whitish fur, lips cyanotic, throat red and injected. The neck showed no palpably enlarged glands. Examination of the chest revealed rapid and shallow respiration (36 to 40 a minute) with greater limitation of movements on the right side. The percussion note was hyperresonant throughout the pulmonary area. The breath sounds were generally somewhat suppressed, except over the apices, where they were quite harsh. The expiration was almost inaudible but when heard seemed prolonged. Auscultation of the breath sounds was quite difficult in places because of the enormous number of fine and coarse crackling râles everywhere. The heart action was rapid and the sounds weak. The abdomen was slightly distended but not rigid nor tender. No masses were palpable. An old scar of previous operation was visible and in midline below the umbilicus. The extremities showed distinct cyanosis of the finger nails, but no clubbing. The temperature ranged from 100° to 101.4° and the pulse averaged 120. Examination of the urine revealed an acid reaction, light cloud of albumin, numerous pus cells, and a few granular casts. No studies for tubercle bacilli in the urine were made. Four sputum examinations were negative for tubercle bacilli. The leucocyte count was 12,900. No differential count was made.

Diagnosis and progress.—The clinical history and physical findings suggested an acute tuberculosis, either of the localized type known as acute bronchopneumonic tuberculosis or the pulmonic form of acute miliary tuberculosis. We were uncertain, but rather inclined to the latter diagnosis. Shortly after admission the patient became rapidly worse, with profound prostration and delirium, and died on the fifth day. A necropsy was secured and instead of finding a miliary tuberculosis, the lesions present were those of a miliary carcinoma. The gross appearance of the lung was so like that of a miliary tuberculosis that at first glance it was considered tuberculous. A feature which caused some comment was the absence of any evidence of an old lesion of tuberculosis at the top of the lungs. Upon examining the other organs, however, especially the liver, the malignant character of these miliary nodules became quite apparent. In the liver they were somewhat larger, several approaching one half to one cm. in diameter, rather sharply defined against the surrounding liver tissue, firm on section, and free from any evidence of caseation. It was at this point that it occurred to us that the ovarian cyst removed February 6, 1920, that is, almost twenty months before, might have had malignant changes. Subsequently we were able to obtain the cyst specimen and sections revealed the changes of adenocarcinoma.

NECROPSY REPORT (ABSTRACT).

Pleural cavities.—The left pleural cavity contained considerable bloodtinged fluid. A number of dense adhesions were present between the layers at the apex and posteriorly. On the right there were numerous dense adhesions and several hundred cubic centimetres of reddish fluid.

Lungs.—The left lung weighed 850 gms. The organ contained consolidated areas throughout; the greater portion of the lower lobe and the lower third of upper lobe were practically airless. The remainder of the upper lobe contained numerous small nodules throughout; on section the lung tissue offered little resistance. The incised surface was red and dotted with numerous yellowish foci; on pressure a rather thick, yellowish, bloodstained material exuded. The bronchial mucosa was very red and covered by a thick sticky mucus. There was no evidence that the lung tissue was breaking down. The peribronchial nodes were only slightly enlarged and red. The right lung weighed 970 gms. and was heavy, nodular and firm. The pleural surface was red. The lower lobe and posterior portions of the upper lobe contained nodular and consolidated areas. The incised surface was red and dotted with innumerable small yellowish foci, and exuded a sticky yellowish fluid. The bronchial mucosa was uniformly red and covered with sticky mucus. The peribronchial nodes were slightly enlarged and red.

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*Presented before the Association of American Physicians, Washington, D. C., May 3, 1922. From the Department of Medicine and Pathology, Jefferson Medical College, Philadelphia.

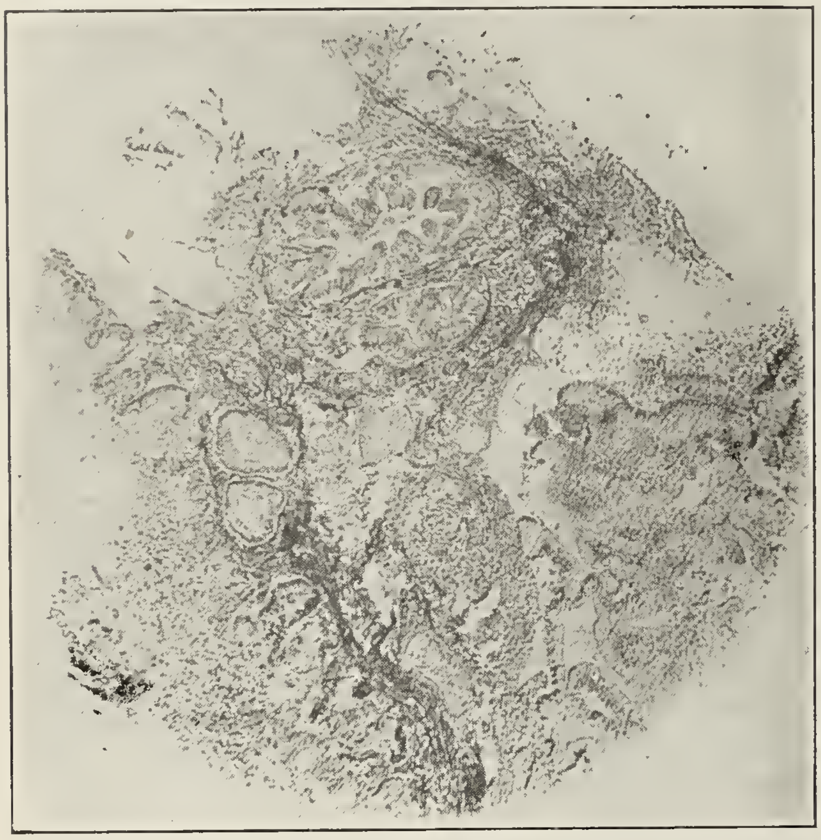

Fig. 1.—A section from ovary removed at operation showing the irregular acini lined by the tall columnar epithelium and also many small papillæ. This same type of growth was found in the other organs at necropsy.

Spleen.—The spleen weighed 150 gms., was soft in consistency and normal in shape. The incised surface was soft and deep red.

Kidneys.—The left kidney weighed 140 gms. and was normal in shape and consistency. Circumscribed yellowish foci were adherent to the capsule and extended into the parenchyma. The normal markings were distinct and the tissue was slightly congested. The right kidney weighed 140 gms., was red in color, and the markings were fairly distinct. No nodules were observed in this kidney.

Liver.—The liver weighed 1,370 gms. and was rather soft. The surface presented a number of small, sharply circumscribed, greyish nodules varying in diameter from two mm. to one cm. The incised surface of the organ appeared normal. The gallbladder and bile ducts were apparently normal.

The adrenals showed no macroscopic change. The stomach and intestines showed no gross lesions. A number of the mesenteric and perigastric lymph nodes were enlarged, firm and greyish in appearance on section. A number of lymph nodes along the vertebral column were enlarged, firm and grey. On the right side of the vertebral column, opposite the first lumbar vertebra, the thoracic duct was markedly dilated and contained a thick yellowish fluid.

The uterus and vagina were normal. The right tube and ovary were absent as the result of removal at previous operation. The left tube was enlarged, red and adherent to the pelvic tissue. The left ovary was enlarged and cystic. In the right side of the pelvis at the site of the previous operation was a firm, irregular nodular mass about the size of an English walnut, densely adherent to the inner surface of the ilium; and just above the brim of the pelvis were a number of enlarged postperitoneal lymph nodes. The aorta and other large bloodvessels appeared normal.

Gross diagnosis.—Acute bronchopneumonia. Diffuse consolidation of both lungs with numerous miliary foci scattered throughout. Chronic adhesive pleuritis with superimposed acute serous pleuritis. Acute salpingitis (left). Probable tumor metastases to liver, lung, postperitoneal and mesenteric lymph nodes, left kidney, and pelvic tissues.

Histological diagnosis.—(Figs. 1, 2, 3, and 4). Adenocarcinoma, metastatic, involving lungs, liver, left kidney, mesenteric and postperitoneal lymph nodes, thoracic duct, and pelvic tissue. Bronchopneumonia. Papillary adenocarcinoma (primary) of right ovary removed at operation twenty months before death of patient. Note: The origin of the tumor found at necropsy could not be definitely determined until the right ovary previously removed was sectioned and examined. This ovarian mass consisted of large cysts which had been opened. The walls were thick and contained small cysts filled with gelatinoid material.

COMMENT.

A retrospect allows of certain comments from the clinical and pathological viewpoints. In a recent clinical contribution (1) attention was directed to one group of cases with malignant disease of the lung in which the clinical features were not unlike those of acute miliary tuberculosis. A primary focus is common to both; and secondary miliary deposits occur from invasion of the blood stream by bacterial emboli in tuberculosis and neoplastic emboli in carcinosis. The knowledge of the existence and character of the primary focus suggests the diagnosis in many cases, in others the obscure character of the primary lesions makes the diagnosis almost impossible. The primary tumor may be in the bronchus, as in the case reported by Elisberg (2). West (3) refers to two reported cases in which patients with cancer of the face developed cough and expectoration with loss of strength and flesh; the necropsy revealing the lungs studded with minute nodules of new growth and dissemination in various organs of the body. Fagge's (4) patient, a man of fifty years, died of bronchitis with pneumonia. The necropsy revealed both lungs studded with nodules, the largest being the size of hemp seed. There were nodules in pericardium, left ventricle, liver, and spleen.

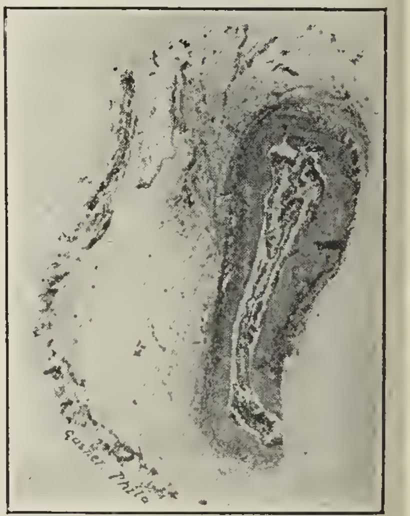

Fig. 2.—A section of the thoracic duct showing tumor cells practically obliterating its lumen.

In the absence of any obvious primary growth, miliary carcinosis is more likely to be mistaken for acute tuberculosis than acute tuberculosis for miliary carcinosis. The sputum examination offers little help when negative, since it usually is negative for tubercle bacilli in miliary tuberculosis unless there is an associated old open lesion at the apices. The presence of the tubercle bacillus in the sputum may not be conclusive evidence of the miliary nodules found postmortem, since both diseases have been found in the same lung. In 1878 S. W. Gross (5) reported before the Pathological Society of Philadelphia, a case in which at necropsy both metastatic deposits and tubercles were found. The patient, a woman, was known to have a scirrhous carcinoma of the breast for seventeen and a half years. During the last year of life she had suffered from cough, occasional slight hemoptysis, and other signs of tuberculosis. At necropsy both lungs showed tubercles, especially the right in which several small cavities were discovered. The lungs were also filled with metastatic scirrhous deposits which varied in size "from a small shot to a cherry." The history of a known malignant focus or a known tuberculous focus in the body ought to suggest the character of the acute illness in this group of patients. It might be argued that our bacteriological and histological knowledge has increased since Gross's time, and the tubercles which he found in addition to the "metastatic deposits" may have been metastatic lesions of a different character and that tuberculosis really did not exist. Gross's knowledge of pathology and the presence of small cavities lead one to believe, however, that he was right in his assumption of the presence of the two diseases. That the history may mislead in the diagnosis, is emphasized by the experience of Hadden (6), who reports the case of a man who following an operation for anal fistula presented symptoms suggesting acute tuberculosis. Death occurred within a fortnight and at autopsy the naked eye appearance of the organs was that of an acute tuberculosis, but the microscope revealed disseminated malignant disease. In our patient the lack of knowledge of the malignant changes in the previously removed cyst, together with the lapse of time between its removal and the development of acute symptoms, led us into error.

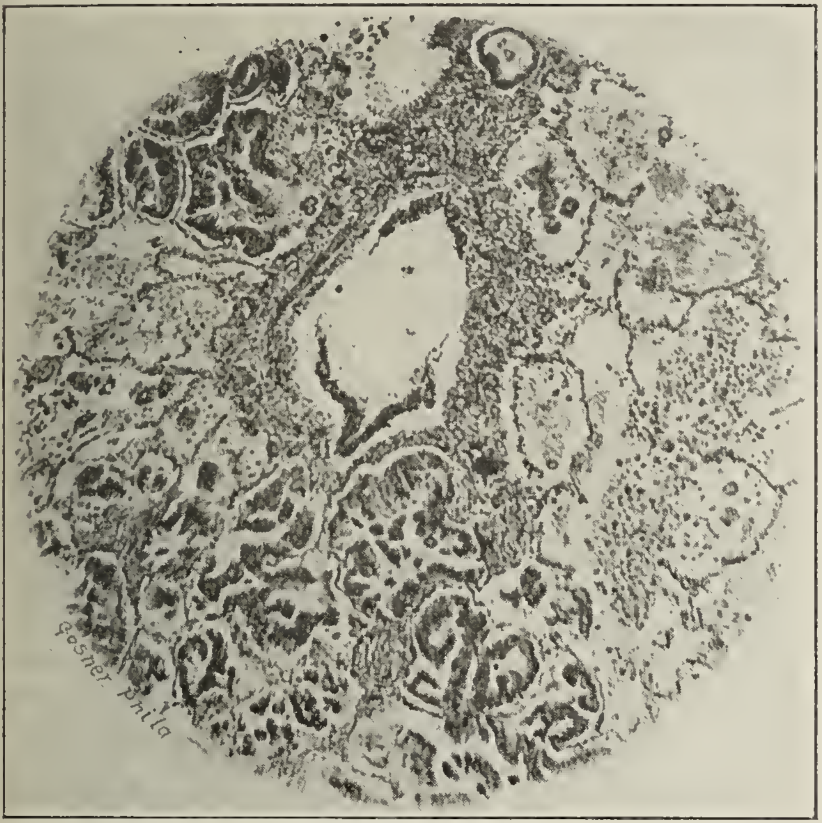

Fig. 3.—A section of the lungs showing the columnar type of the tumor cell; the attempt at acinus formation is very evident. The tumor cells are crowding the air spaces.

Schmidt (7) reports two cases of miliary carcinosis in one of which the correct diagnosis was made during life. The first patient, a woman of thirty-six years, had symptoms suggesting miliary tuberculosis. The normal lung findings, afebrile course and negative diazo reaction were taken as evidence against the diagnosis of miliary tuberculosis. The intense dyspnea and the presence of enlarged lymph nodes in the left supraclavicular region suggested malignant disease. Death in two months with necropsy studies revealed miliary carcinosis. In the second case the carcinosis was assumed during life and postmortem to be miliary tuberculosis until the microscope revealed the carcinosis. In both patients a small cancer was found in the stomach and Schmidt thinks that this is generally the rule, i. e., minute primary cancer plus greater tendency to metastases, large primary cancer with less generalized metastasis. Among nine patients which Schmidt gathered from the literature the age incidence varied from twenty-three to thirty-six years, except one aged seventy-four years. He concludes that miliary carcinosis affects mostly young individuals. Our patient was twenty-eight years of age.

SUMMARY.

1. A case report of miliary carcinosis.
2. Twice during the life of a female of twenty-eight years an incorrect diagnosis of tuberculosis was made. Upon the first occasion tuberculous peritonitis proved by operation to be an ovarian cyst. Twentv months later an acute illness diagnosed by us as acute tuberculosis proved by necropsy to be miliary carcinosis.

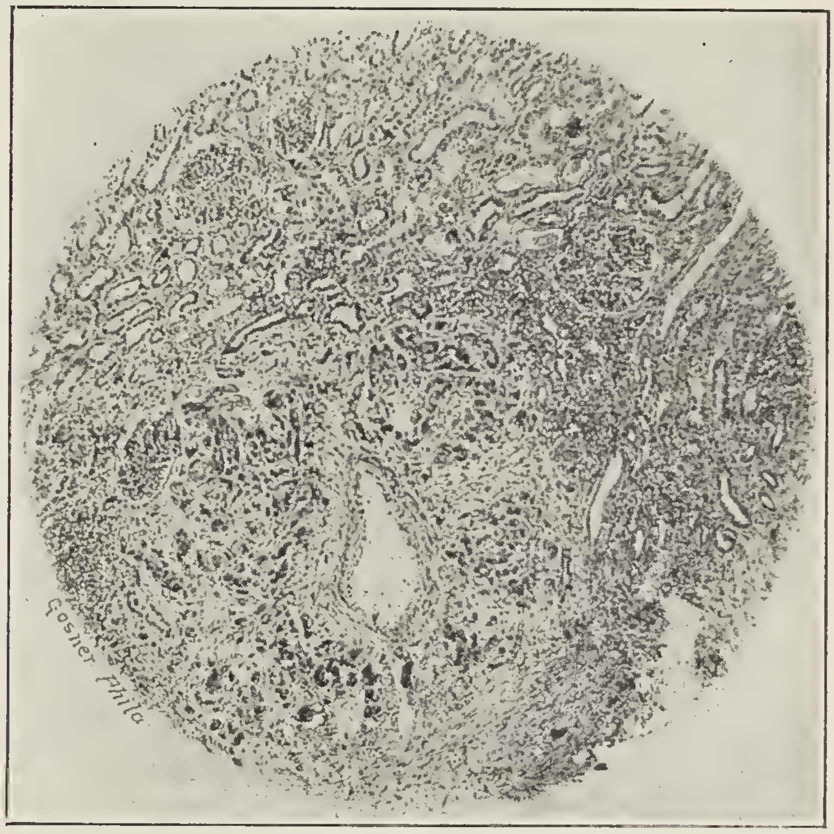

Fig. 4.—A section of the kidney showing small metastatic lesion.

3. The delayed study of the ovarian cyst speci-

men showed the probable primary focus, an adenocarcinoma in the cyst wall, thereby linking up the first and second illnesses wrongly diagnosed as tuberculosis.

4. The delayed and subsequently acute metastases probably resulted from invasion of the blood stream by way of the thoracic duct.

5. The long interval between the removal of the malignant ovarian tumor and the dissemination of the secondary growths. It was evident from the small size of the nodules in the various organs, that dissemination must have been quite recent. We are unable to explain what factors determined the latency of the tumor cells and then their sudden invasion of the blood stream; or the freedom from involvement of the peritoneum which is so frequently the site for secondary growths from this type of ovarian tumor.

The author's references will appear in his reprints.

The Significance of Gastrointestinal Disturbances in Early Pulmonary Tuberculosis

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The rôle of the gastrointestinal tract in nearly all of the acute infectious and contagious diseases is well known. Influenza, pneumonia, cerebrospinal meningitis, typhoid fever and many other infectious diseases, often begin with gastrointestinal symptoms prior to any other clinical manifestation of diagnostic value. Pulmonary tuberculosis is no exception. So far we have been unsuccessful in recognizing any of the important clinical signs upon the entrance of the tubercle bacilli in the body. If this were possible the mortality of pulmonary tuberculosis could be reduced to a minimum. Some years ago, when the tuberculin tests became popular it was thought that ultimately this disease would be early recognized. Inasmuch as physical signs are usually prominent when one or more of the tuberculin tests are positive, we are handicapped now as never before. No one will deny that cases cannot be classed in the incipient stage when physical signs are clearly demonstrable. The presentation of a paper on this subject should be welcomed, in spite of the fact that nothing original is offered. The little we know about this subject is in my opinion not sufficiently emphasized and we are justified in presenting conjectures and theories relative to this subject.

Among symptoms applicable to pulmonary tuberculosis that of the gastrointestinal tract is important. One of the first symptoms which seems to attract but little attention not only by the patient but also by the physician is anorexia. When this exists for some time the vitality is undoubtedly affected. Insufficient food for a prolonged period will weaken the patient by reason of undernourishment and hence diminish the resisting power considerably. A slightly coated tongue, often constipation, occasional diarrhea, a sense of fullness and depressed feeling after eating, are conditions which may exist for a long time. Hyperacidity, with its epigastric discomfort may be the first manifestation. The more one studies this disease the more attention should be directed to the numerous modes of onset encountered. In one case a simple dyspepsia may be present, in another typical hyperchlorhydria, and in a number nausea; and on examination a pathological condition is often found in one or both lungs. Loss of weight, plus a history of digestive disorders, should be looked upon with suspicion.

Tuberculosis of the stomach and viscera are common but in the majority of cases is either secondary or complicated by a preexisting pulmonary tuberculosis. A reversed condition, pulmonary tuberculosis secondary to that of the stomach, is not probable. Until the last decade tuberculosis of the abdominal viscera remained almost entirely within the domain of the pathologist. The surgeon, long before the internist, attempted to place definite symptomatology relative to the diagnosis of abdominal tuberculosis by demonstrated lesions heretofore discredited. In 1886, Joseph Coates (1) first discovered the tubercle bacilli in a gastric ulcer. Lava and Orlandi (2) told of the failure to find tuberculous lesions in the lungs or in any of the organs in cases of ulcer where the bacillus was isolated.

Infection in gastrointestinal tuberculosis was thought to occur through the tubercle bacilli being taken with food or swallowed with the sputum. Recent investigators proved that in the majority of cases it is through an extension of infection from another organ and also possibly through the blood stream. The latter theory is more plausible because of the fact that the normal gastric juice furnishes a certain amount of protection against the tubercle bacilli; although it has no specific bactericidal qualities. In short, there are sufficient physiological reasons why the alimentary tract has a great resistance to tubercle infection, unless there are sufficient alterations in the normal acidity of the gastric juices.

Pain in the region of the stomach, anorexia, occasional vomiting of blood and diarrhea are a set of symptoms, while not sufficiently distinctive, are nevertheless suggestive. Hotchkins (3) states that gastric analysis helps one to a more definite conclusion, inasmuch as in early tuberculosis an increased acidity exists which is undoubtedly due to a reflex origin. It is well to bear in mind that in the later stages of the disease the opposite condition usually exists, that is, a deficiency in the hydrochloric acid.

F. M. Pottenger (4) explains the origin of the gastrointestinal phenomena in pulmonary tuberculosis. I value his physiological explanation so highly that it would not be amiss to mention just what he said. "The embryological origin of the respiratory system from a diverticulum of the gastrointestinal canal, gives to the lung the same double innervation as that of the intestinal tract. All smooth musculature and all secreting glands of the lung and bronchi, like those of the stomach and intestines (except the sphincters) are activated by the vagus nerves and inhibited by the sympathetic. When the lung is inflamed, the sensory fibres of the pulmonary branches of the vagus are irritated and this produces a reflex stimulation of the motor neurons of the vagus which supply the gastrointestinal canal. The common gastrointestinal symptoms typical of preponderating vagus stimulation are nausea, vomiting, hyperchlorhydria, gastric supermotility, colicky pains, spastic conditions of the intestines, notably spastic constipation, colitis, diarrhea and intestinal stasis. It is this group of functional disturbances that is found most frequently in patients suffering from early active or chronic semiquiescent tuberculosis."

T. A. Groover and A. C. Christie (5) report that in an analysis of 1300 cases referred for gastrointestinal study, six and a half per cent. were tuberculous. The gastrointestinal symptoms in all cases were secondary. A number with early lesions were found but strange to say out of the six and a half per cent. reported the majority showed lesions of a chronic slowly progressive type. Ernest H. Gaither (6) in his article points out that in a number of cases which were presented at the Johns Hopkins Dispensary, the patients exhibited none but purely digestive complaints, that is, loss of appetite, pyrosis, fullness, distress, at times pains in the epigastrium, flatulence and numerous other disturbances. These patients, after a careful investigation, were found to be suffering from pulmonary tuberculosis and not infrequently a cavity formation already existed.

In conclusion I would like to reiterate that it is important to bear in mind that transference of signs and symptoms in any disease is common. How often has a diagnosis of appendicitis been made when the patient had pneumonia? How often has acute indigestion been mistaken for acute dilatation of the heart? And so we may continue to enumerate example after example to show how frequently a mistaken diagnosis may be made. Surely it is imperative, as I have already stated elsewhere (7), that a close survey of all the symptoms necessary and a thorough physical, analytical and fluroscopic examination be done to make an early diagnosis. It is my opinion that a specific for tuberculosis is far from being in sight, and so far our only available weapon in checking the spread of the disease is early diagnosis.

The author's references will appear in his reprints.

A Preliminary Study of the Antibody Relationship of Members of the Streptococcus and Bacillus Coli Groups*

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As a part of the comprehensive research being conducted by Dr. Henry A. Cotton, medical director of the New Jersey State Hospital for the Insane, at Trenton, N. J., into the influence of focal infections on mental disturbances, it has been necessary to make a large number of cultures from stomach washings. Cultures have also been made from material from other sources, such as tonsils, teeth and lymph glands. The organisms most frequently found have been various types of streptococci, colon bacilli, and staphylococci.

For certain reasons attention has to a large extent been focussed on the streptococci and colon bacilli and vaccines prepared from members of these groups have been used on rather an extensive scale. These vaccines in part have been prepared from stock strains and in part have been autogenous. The question arose as to the nature of the immunity that patients would get from these vaccines. Provided there was antibody production, the stock vaccines might not produce immunity against every strain of streptococcus and colon bacillus; there might be sites of infection missed in getting organisms for autogenous vaccines.

To begin an answer to the question, the following work was done. Two rabbits each were immunized against two strains of streptococci, Streptococcus pyogenes and Streptococcus salivarius; and two rabbits each, against two strains of colon bacilli. By means of complement fixation and agglutination tests, and testing each rabbit's serum against each of the four organisms, an attempt was made to find to what extent the antibodies formed were specific or common. The scope of the work so far done does not justify a detailed review of the literature on similar work.

The procedure was as follows: Rabbits weighing about 2,500 grams were used. They were injected subcutaneously over the abdomen. The four antigens for the injecting were prepared as follows: The thirty-six hour growth from ten large agar slants of Streptococcus pyogenes 721 T was suspended in about fifty c. c. of .4 per cent. tricresolized physiological saline and killed by heating in a waterbath at 56° C. for twenty-five minutes. This streptococcus was obtained from the tonsil of a patient at the hospital. It is a rather large, gram positive, short chained hemolytic coccus that forms acid on salicin and lactose and no acid in mannit sugar free agar in forty-eight hours' growth. It sediments in bouillon. With the Streptococcus salivarius antigen twelve large agar slants were used. Otherwise the procedure was the same as with the pyogenes antigen. The salivarius culture was obtained from a patient at the hospital. It is a small, gram positive, short chained nonhemolytic coccus that forms acid on lactose, no acid on salicon, and mannit sugar free agar in forty-eight hours' incubation. There is a cloudy growth throughout the bouillon cultures.

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These two streptococci were typed according to the classification of streptococci, by W. L. Holman (1). For the two colon bacillus antigens, Bacillus coli communior and Bacillus acidi lactici, the growth from three large agar slants was used for each culture. The procedure was the same as with the streptococcus antigens except that the killing was by heating in a waterbath at 60° C. for one hour. Both the colon bacilli cultures have been described by C. E. Winslow in Studies on the Classification of the Colon Typhoid Group of Bacteria with Special Reference to Their Fermentative Reactions (2), and obtained from the collection then in New York at the American Museum of Natural History. Bacillus coli communior is a medium sized, gram negative bacillus with small transparent colonies on agar plates. It gives a positive indol test, forms acid and gas in lactose and sucrose, no acid nor gas in salicin sugar free agar. It has a cloudy growth throughout bouillon. Bacillus acidi lactici is a pleomorphic gram negative bacillus with large transparent colonies on agar plates. It gives a positive indol test. It forms acid and gas in lactose, no acid nor gas in salicin and sucrose sugar free agar. It sediments in bouillon to some extent and forms a pellicle at times.

Four of the rabbits, one for each of the four above mentioned organisms, were treated with gradually increasing doses of antigen over a period of about four months. These were: Streptococcus pyogenes rabbit No. 85, received 74.5 c. c. of the antigen; Streptococcus salivarius rabbit No. 18, received 68.5 c. c. of the antigen; Bacillus coli communior rabbit No. 72, received 80.5 c. c. of the antigen, and Bacillus acidi lactici rabbit No. 54, received 79 c. c. of the antigen. Four others, one on each of the test organisms, were treated in the same way over a period of about two months. These were: Streptococcus pyogenes rabbit No. 61, received 41.5 c. c. of the antigen; Streptococcus salivarius rabbit No. 43, received 43.5 c. c. of the antigen; Bacillus colicommunior rabbit No. 96, received 33.5 c. c. of the antigen, and Bacillus acidi lactici rabbit No. 29, received 39.5 c. c. of the antigen. Four days before the final tests and two weeks after the last injection, the animals, with one exception, and a normal rabbit for control, were bled out, the serum obtained inactivated at 55° C. for twenty minutes and .5 per cent. chloroform added. The one exception was Streptococcus pyogenes rabbit No. 85 which died. Serum of this rabbit collected ten days before the final tests and thirteen days after the last injection was used in the final tests. It had no preservative added and was inactivated at 55° C. for twenty minutes. The serum as described above was used in making the complement fixation tests and agglutination tests together with some anticolon bacillus streptococcus horse serum.

COMPLEMENT FIXATION TESTS.

Method.—Antigens were all less than a week old. They were killed suspensions of pure twenty-four to forty-eight hour agar slant cultures of the respective organisms in physiological saline. The streptococci were killed by heating in a waterbath at 56° C. for twenty-five minutes. The colon bacilli were killed by heating in a waterbath at 60° C. for one hour. Before using, the antigens were filtered through several thicknesses of gauze to remove clumps. They were titrated with the hemolytic system reagents used in making the tests and one half the anticomplementary unit was used as the dose of antigen.

The setup for the tests was: .1 c. c. serum dilution; .7 c. c. antigen dilution, and .1 c. c. guineapig complement. The tests were placed in the waterbath at 37.5° C. for one hour. Then .1 c. c. sensitized sheep red blood cells, a 2.5 per cent. suspension of packed cells, added. After another hour at 37.5° C. in the waterbath, the tests were placed in the icebox overnight and read in the morning. Readings were recorded as follows: ++++ complete fixation; +++ almost complete; ++ fixation; + small amount of fixation; ± few red blood cells in bottom of tube; — negative. The hemolytic system, serum and antigen controls were all negative. There was no hemolysis in the corpuscle control. These controls were run in duplicate.

AGGLUTINATION TESTS.

Method.—The antigens were saline suspensions of pure twenty-four to forty-eight hour agar slant cultures of the respective organisms, emulsified with glass beads, filtered through gauze to remove clumps, and contained about one billion organisms to the c. c. The setup of the tests was: .5 c. c. serum dilution, and .5 c. c. antigen. The tests were placed in the incubator at 37.5° C. overnight and readings then recorded as follows: ∏∏ complete agglutination; |∏ almost complete; ∏ partial; | few agglutinated; + doubtful; — negative. Antigen controls were run in duplicate. They were negative with the exception of the Streptococcus pyogenes antigen. Since it agglutinated spontaneously the tests with it were not read.

SUMMARY.

There was practically no common complement fixing body or agglutinin production by members of the streptococcus and members of the colon bacillus groups. Streptococcus pyogenes showed little complement fixing body production with results at variance. It had no agglutinin production for Streptococcus salivarius. Streptococcus salivarius showed little complement fixing body production but that was specific. It had fair agglutinin production. Bacillus coli communis showed complement fixing body production more specific for itself than for Bacillus acidi lactici. Its agglutinin production was almost completely specific. Bacillus acidi lactici showed complement fixing body and agglutinin production practically common with Bacillus coli communior.

CONCLUSIONS.

There was practically no common complement fixing body and agglutinin production by members of the streptococcus and members of the colon bacillus groups. The complement fixing body and agglutinin production by Streptococcus pyogenes and Streptococcus salivarius seemed on the whole to be specific. Bacillus coli communis had rather specific complement fixing body and agglutinin production while that of Bacillus acidi lactici was practically common with Bacillus coli communior. Work of this nature using many more strains as antigens should be done.

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Repairing the Human Machine

By FREDERIC G. ELTON, M.D.,
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This is not a plea but a demand for more constructive work on the part of doctors and surgeons in rendering medical and surgical assistance to the injured workmen of this country. If the necessity for the conservation of waste material is admitted; if the economic reasonableness of repairing a machine so it will again produce is granted as good business, then the salvaging of an injured worker who, injured, is waste material and who, as a human being, is the greatest of all machines, demands equal attention.

The necessity for the using of waste material has, for a long time, been admitted, and much that was formerly considered as useless is now used in the manufacture of marketable products.

The first step in the restoration of an injured worker, like that of the soldier, lies in the hands of the doctors and surgeons and, to a large measure, the responsibility for success or failure rests with them. They must come to appreciate that it is not merely a question of saving a life, of sewing up a wound, or amputating several fingers, but of making it possible for the person to live the life after it is saved and again to be selfsupporting.

Physical restoration of the person must be as complete as it is scientifically possible to make it. That the doctor or surgeon either advances or hinders the reestablishment of the injured is shown by experience. The extent to which he has cooperated with those responsible for the person's reemployment, the extent to which he allowed his skill to be guided by a knowledge of the work a man or woman had done and must do, does often show in the result.

Unfortunately, the human machine is sometimes repaired without a thought that the main purpose is to keep it productive and quite often this repair work is done without the mechanic who performs the operation having any knowledge of the work that the particular machine has been doing. Any good mechanic called upon to repair a machine realizes that not only must he make that machine run again, but that he must make it produce the article it was intended to produce. The point is, however, that there is a definite purpose in the repair work which is often lacking in our medical and surgical services.

That this attention is not given is constantly being evidenced among injured workers seeking employment. These examples of lack of proper attention and consideration of the employment possibilities of the injured person might be classified under two headings, poor surgery and lack of proper appreciation of the fact that the person must work and the operation must be performed so as to make adjustments that will assist him in working rather than hinder him.

As examples of poor surgery we have the young man who fractured his right arm about two inches above the elbow joint. The arm was set improperly so that the forearm could not be raised above a horizontal position. It is clear that there was no thought given to this machine being made even to run, let alone perform some particular work. A second operation was necessary several years afterward and the fractured bone in the upper arm was chiseled away so that the hand could be brought again to the shoulder.

Another is that of a man who had injured his wrist in cranking an automobile. He went to his family physician who told him the wrist was not broken, but merely sprained. After eight weeks' treatment for a sprain, the wrist was finally x rayed and showed that it had been broken.

Still another is that of a man who had a double fracture of the right ankle, caused by being thrown from an express wagon. He was taken to a hospital, but for some reason was sent home without having had anything done to him. During the night the pain was so great that his private physician was called to set the bones and placed the leg in a plaster cast. The doctor of the insurance carrier, calling the next day and finding the leg in a plaster cast, did nothing. Four months later, when the cast was removed, it was shown that the bone had been improperly set. The result was that the right leg was about one inch shorter than the other and the man suffered considerable pain. He can walk only short distances and cannot stand for any length of time.

Then we have examples of the second class which show that operations were not performed with the idea of making possible the person's return to some particular occupation.

The carpenter, having put his right hand in the way of a circular saw, received an injury which resulted in the loss of the index finger, the middle finger and the upper part of the third finger of his right hand. The thumb was badly cut at its base. The operation was performed upon this man with no attention being given to his occupation. The thumb was removed although the man protested against it. It could have been saved and the only reason given for its removal was that infection might have set in. In amputating the middle finger, a portion of the bone near the knuckle was left protruding beyond the hand, while the third finger was allowed to heal in a rigid position. Consideration of what might have been done for this man in the light of his occupation shows that if the thumb had been left on the hand, the third finger treated so that it could be flexed and the protrusion of the second finger had been removed, the man could have successfully handled his tools and returned to his old job. However, the thumb being removed and the stump left, we find that if the protrusion of the second finger had been removed and the third finger properly treated, the man would have still been able to use this finger and the stump of the thumb to pick up things and hold them in his hand. In his present condition, however, his hand is practically useless to him. It is evident that not much thought was given to the operation of the machine nor the particular product that that machine had been called upon to make.

A young woman, working in a laundry, had her hand crushed in a mangle. The little finger was permitted to heal in a rigid position, slightly bent, so that it was continually in her way. From an occupational viewpoint it would have been far better to have amputated it at the second joint, but apparently the surgeon was primarily interested in preserving the fingers regardless of their purpose and usefulness.

A similar condition is recalled of a man who had a rigid index finger and the second finger had been permitted to heal in a rigid position overlapping the index finger, a condition decidedly detrimental to any kind of work in which he might be employed. An operation was performed upon this man whereby the second finger was placed in its proper position and by the transposing of tendons, the flexion and movement of both fingers was obtained.

These examples show the necessity for emphasizing the point that our doctors and surgeons must give greater consideration to the problem of living rather than to the problem of saving a life and tying up a wound. Too much importance cannot be given to the part that good or bad physical restoration plays in the rehabilitation of the injured worker. The responsibility for doing their part towards the successful completion of any rehabilitation program of the injured worker, that first step, intelligent industrial physical restoration, is squarely on the doctors' and surgeons' shoulders and they must accept it.

Why Does Not Prohibition Prohibit?

By S. DANA HUBBARD, M. D.,
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Is the Eighteenth Amendment to our Constitution, enforced through the Volstead Act, supported by the various and individual State Acts of enforcement, successful today in solving the intoxicating beverage problem? I have asked myself this question and have kept my ear to the ground, like the farmer who comes to town to learns the news, and I still hesitate to reach a conclusion. Prohibition has solved the problem for those who have gone the wood alcohol route, the synthetic gin route, the poisoned whiskey route. These lives have paid a dear price and as a man I pity their untimely ending. I am not heartless enough, to think even for a moment, that they deserved their fate because they violated this law. No! A thousand times NO. We Americans have so many laws that it is impossible not to break one almost daily. If you drive an automobile you violate the law time and again. In the same manner, if we prohibit, by statute, "the manufacture, sale or transportation of intoxicating liquors," we make a law that, through legal interpretation is impossible not to break.

The Eighteenth Amendment reads:

> The manufacture, sale or transportation of intoxicating liquors within, the importation thereof into, or the exportation thereof from the United States, and all territory subject to the jurisdiction thereof for beverage purposes is hereby prohibited.

The language is simple, but far from plain.

It would appear that it was the intention of the framers of this statute to prohibit intoxicating liquors for beverage purposes in the United States. If one has ever attempted to write law, or to state in a few words something that affected a great many people, he will find that English is at best a difficult and trying language. Our foreign friends ask, What do you mean? They learn our language from tutors and books and then come here and find that neither can they make themselves understood nor can they understand us. In thinking one's way through the prohibition problem one must be careful, cool and considerate. Nowhere is judicial calm more necessary.

The Eighteenth Amendment to the Constitution is enforced by a Federal law known popularly as the Volstead law. The law was enacted by the process prescribed by the Constitution. No referendum was taken for the reason that no referendum is provided for by the Constitution. This amendment was adopted in precisely the same way in which the previous seventeen amendments were adopted.

So much for legal regularity.

Some people say "they put one over on us," another says "I had no voice in the making of this law and so I do not have to stand for it." Now my friends, all of you who can read, know that this law was debated as early as 1913, when in Columbus, Ohio, a movement was launched in behalf of National Prohibition. All through 1915 and 1916 this subject was debated in church and platform throughout this country from every point of the compass and almost continuously discussed by the press.

HISTORICAL FACTS.

About fifty-three years ago the Prohibition Party was formed. About forty-nine years ago the W. C. T. U. was organized. It was about twenty-nine years ago that the Antisaloon League began its work. The State of Maine adopted prohibition in 1851, Kansas in 1880, North Dakota in 1889, and Georgia in 1907. By their own acts thirty-three states voted prohibition as a state policy before National Prohibition was adopted. Before prohibition was nationally adopted the balance of fifteen states saw an added ten join these ranks. In 1918 there were 3,030 counties in the United States and of these 2,392 had voted "dry!" These records no doubt show to any open mind what a good many of our voters actually think on this question from a political point of view.

HOW WAS THIS AMENDMENT ACHIEVED.

This is an important question, because it is by knowing "when and why" it is expected to determine what part of our people are behind this regulation.

The resolution submitting the amendment to the states was passed by the United States Senate on August 1, 1917, and by the House on December 17, 1917. The Senate voted sixty-five to twenty; the house voted 282 to 128. Forty-six of the forty-eight states have now ratified the amendment. In forty-five state legislatures the total vote for ratification was 1,288 for to 213 against in senates, while in the houses the vote for was 3,739 to 934 against. Thirty-six legislatures are required for ratification.

So much for the economics of the situation. Now for the civics. Who did this? There are those who have analyzed the situation and are of the opinion that it was as usual, "the intelligent minority," who through publicity and money put it over. Who are the intelligent minority? If reading puts light on this subject I would indict all men and women behind big business. This includes life insurance interests, scientists, philanthropists, college men, physicians, teachers, public health officials, welfare workers, railway interests, mining interests, many important industrial groups, and lastly our churches and their allied helpers. Such are the facts as given in our statistics, our press, and our class journals. Informed and intelligent persons, believing in a democracy, a government "for, of, and by the people," know that what can be made legal by a due process, if a mistake has been made, can be amended or repealed, if necessary, to meet the wishes of the majority of those governed.

ASPECTS OF THE PRESENT DAY LIQUOR PROBLEM.

As a preface to this consideration, we will refer to our text "Why Prohibition does not Prohibit," because, in our experience, statistically and circumstantially, here and elsewhere, in this country, my conclusion is that so far prohibition has not prohibited and I am desirous of learning the reason why.

Will national prohibition prevent alcoholic indulgence? The answer is probably best given by asking if State prohibition has stopped alcoholic indulgence? We have shown here that prohibition has been on trial since 1851, and that thirty-three states voted prohibition before the adoption of national prohibition. What have been the consequences?

Prefacing our argument, let us be fair and state that as yet the machinery of enforcement and the education of the people have not been adjusted to this novel requirement. Men with will power and brains correct and check bad habits as early as indications show that such practice is bad. Others do not lend themselves to correction so quickly. The feebleminded person has will power materially impaired and cannot break evil or vicious habits. The saloon has been closed. The beer and whiskey signs have been painted over. But we are informed that though the statute is on the books, and there are some officials trying to enforce the statute, and some courts are puzzling over interpretations of the language, anyone anywhere who has the price and knows "the ropes"—because it is not done openly—can get liquor. This I am sorry to have to state publicly is also the national situation. The statistics of enforcement clearly demonstrate that liquor can be had today, three years after the initiation of this regulation.

The national government operates on a fiscal year, July 1st to July 1st. Today, the newspapers inform us that there are pending 68,562 prohibition cases in the Federal courts alone. In addition there are many more thousands of cases in state and municipal courts. Comparison of annual reports show heavy increases of such cases instead of a reduction, which would be the reaction if the public were inclined to cooperate with this regulation. If this proportion continues, "it will be—as one of our wits, recently remarked—more fashionable to be on the inside looking out than on the outside looking in." (Meaning of course a jail.)

The prohibition bureau turned into the treasury a total of $4,804,271.95 for fines collected in a year; 35,469 persons have been indicted for violation of this act. Such wholesale deviations from the spirit and intent of this regulation are not indicative of cordial cooperation.

The experience of the department of health is shown in the following table:

REPORTED DEATHS FROM ALCOHOLISM.

Year	*Alcoholism*	*Wood alcoholism*	*Acute alcohol poisoning*	*Total*
1910	621	6	8	635
1911	636	6	2	644
1912	570	4	3	577
1913	656	3	2	661
1914	660	5	0	665
1915	562	1	2	565
1916	687	2	1	690
1917	560	8	2	570
1918	252	4	1	257
1919*	176	38	1	*215
1920	98	29	0	127
1921	119	14	8	141
1922	272	15	8	295

*The first year of national prohibition.

Interpretation.—The yearly experience total shows a gradual reduction with occasional increases. In 1918 the year prior to the prohibiting amendment was the best of the series. In 1919 and 1920 the reductions were attributed to the amendment. The sharp rise in 1922 is disquieting. This total is actually greater than that of 1918 prior to national prohibition. The totals for wood alcohol indicts prohibition as not in a single prior year was there an approximation of such an experience as was had in any of the years of prohibition.

The following table gives the number of admissions of cases of alcoholism in the city hospitals:

Year	*Bellevue Hospital*	*Kings County Hospital*	*Total*
1918	728	1,030	1,758
1919	623	736	1,359
1920	390	651	1,141
1921	2,503	842	3,345
1922	4,083	1,541	5,624

The Commissioner of Health sent out a questionnaire to every hospital in New York city asking for a report on the number of admissions to their wards for the previous five years where a diagnosis of alcoholism had been made on any patient. Twenty-nine hospitals responded, reporting as follows:

	Total	
1918	5,710	
1919	4,877	
1920	3,941	
1921	4,338	
1922	6,869	Aggregate 25,735

The figures show an increase in the number of cases of alcoholism in all the institutions specified of fifty per cent. over the figures for 1921, more than seventy per cent. over 1920: forty per cent. over 1919 and twenty per cent. over 1918.

The total arrests for drunkenness reported by Police Commissioner in New York, are as follows:

1918	5,323
1919	5,562
1920	5,936
1921	6,237
1922	7,866

This five year period shows that the lowest number reported by the police commissioner was in the year prior to prohibition. Since this period there has been an ascending amount year by year. The year 1922 showing a forty-seven per cent. increase over 1918.

WHAT IS THE ATTITUDE OF THE MEDICAL PROFESSION.

Medical men have been sorely tried by this regulation. A cursory reading of the amendment, one would think, would show that the manufacture, sale or transportation of intoxicating liquors for beverage purposes, was not in any way connected with the healing art. How, and by what argument, public officials interpreted this law to apply to the practice of medicine is beyond my powers of comprehension. But they have, and have established the most complex and time consuming regulations regarding medicine and alcohol that is annoying, interfering, and preventing proper practice. The largest group of physicians—the American Medical Association—through its house of delegates went on record relating to the attitude of medicine in reference to alcohol and healing. Later a questionnaire sent to a large number of doctors in active practice showed by a small majority, fifty-one per cent. to forty-nine per cent. that physicians considered whiskey a necessary therapeutic remedy. We are informed by the press through the director of prohibition that in New York State there were 12,500 physicians holding permits to prescribe whiskey in 1921. There were 15,602 doctors duly registered in this territory at this time. During this period twenty per cent. of the prescription blanks furnished physicians for prescribing alcohol for the sick were used. This is an average of seventy-six prescriptions for alcohol out of an allottment of four hundred a year for each doctor.

This is an eloquent reply to the question of medical cooperation in the face of the most bedeviling regulations. Physicians as a class dislike and oppose anything that restricts their best intentions in the treatment of their patients, and they nevertheless are in duty bound to encourage and aid in the proper enforcement of all laws.

BOOTLEGGING, ILLICIT IMPORTATION AND SALE.

The Eighteenth Amendment has occasioned a vast army of illict traders in alcoholic beverages, perhaps the greatest in history. If personal experience is an indication of the vastness of the extent, it may be multiplied in imagination *ad lib.* England charges a tax of two dollars on each gallon of liquor exported. The press informs us that there was exported to the Bahamas one million, two hundred thousand gallons last year. Recently there was arrested a man known as the king of the bootleggers. It was openly stated that this alien, of a few years' residence had amassed a fortune of several millions. A bootblack in a village on Long Island, openly exposed in a barber shop sixteen one thousand dollar bills. Grapes which formerly went into grape juice—the unfermented kind—sold in the market for $75 a ton. Last season grapes brought as high as $350 a ton.

Instead of public house—saloon—indulgence today we have home drinking. There has been noticed in many localities an increase in school absentees, in cases of incorrigibility, and a marked increase in drinking and hip toting among young people, who evidently think it smart. It is well known that children are great imitators and have the habit of mimicking their elders, and these innocent little ones think this drinking is mannish and smart. Sad to relate, immoderate indulgence by the youthful leads to many unpleasant conditions. Promiscuous relations are embarrassing and our officials report an increasing number of children born out of wedlock.

And so on and on *ad infinitum,* but these reactions are to be expected under present unfortunate conditions which have been brought about by opposition to this amendment. The naturalist and trainer knows that to accomplish anything in training animals, a little progress should be made, time after time. Now the prohibitionist could not stand for abolishing hard liquor or taxing it out of existence, but extremist that he is, takes his unpleasant medicine all at one gulp, with the natural reaction that an unprepared stomach rejects an overdose. The public would have no doubt stood for a partial regulation, but an absolute annihilation was attempted, and instead of the result desired by all intelligent and thinking individuals, opposition and abuse were the result. Not only opposition and abuse of this one act but prominent men, the press, in lecture and in news, inform us that all law is brought into disrepute. Crime is certainly on the increase.

A final indictment, in this locality at least, is that prohibition appears to have shifted a normal ninety-five per cent. beer drinking population to a hard liquor group. May we not here ask, if this is permitted to continue, what will be the effect on our public health?

WHY DOES PROHIBITION BY STATUTE FAIL TO SOLVE THIS PROBLEM?

Governments cannot improve man. It is the task of man to improve governments. Every attempt to improve morality by law is productive of disorder. Temperance cannot be made possible by statute. Temperance cannot be bought. Legislation often fails. Education never does. There is one safe, sure way to make progress, moral progress at least, and that is, through the hearts of informed men and women. Perfection is a priceless possession and good conduct is the characteristic of the intelligent. Dr. Brookfield, an ardent advocate of temperance in England remarked on this subject in 1841—it was true then, it is true today—"Temperance, you know, is not abstemiousness (prohibition) but well proportioned use of things."

The one simple fact is positive—legislation covering drinking of intoxicating beverages is not going to be respected and public statute is helpful in government only so far as it is respected and willingly supported by public opinion and absolutely no further.

CONCLUSIONS.

State wide prohibition has not prohibited and national prohibition is also for this one reason doomed to failure. America is a temperate, intelligent nation and has fought for and loved freedom. Prohibition by statute annihilates personal liberty.

Prohibition fails because the United States is bounded on the north by hard liquor, on the south by liquor, on the west by rum and on the east by no limit.

It may well be doubted whether there is or has been at any time a State in this union in which a majority of the voting population were abstainers or even believers in prohibition as applied to themselves.

Those wanting a drink, will get it, law or no law. The man too lazy to attend church just around the corner will walk five miles to keep a date with his bootlegger.

We have at best but imperfect means of measuring the effect of alcohol on man but prohibition meets its crucial test in asylums, hospitals, prisons, police courts, almshouses, and vital statistics.

The story may not be as plain as the handwriting on the wall but it is written and those intelligent enough to read and reflect know the verdict.

The net results of study so far of this momentous question is that prohibition by statute is not productive of that reaction which most of us desire when we legislate in behalf of betterment of our fellowman. The law, then, is not the answer. Regulation by statute, if it is not too reactionary may help but when we consider our people as compared by their intelligence quotient with other nations a better plan would have been education.

The normal man will never become a drunkard.

The vast majority of our people, ninety-five per cent. are of this type of manhood. The man with the "squint brain" is the potential dipsomaniac, and once the habit is acquired will go through fire and water, in any weather, to get his drink. Let the recognition then between the normal and the abnormal person guide us in our reforms.

Men with unstable or enfeebled intellects are absolutely powerless to resist the impulse to drink. The possible reform that lies nearest to success looks to the right treatment of individuals who are victims of the lust for alcohol.

HOW MAY A COMMUNITY PREVENT POTENTIAL DRUNKARDS?

As a first consideration there must be personal health in order to have good public health. Health is not the effect of a desire; it is won by effort. He who would have health must work for it; wishing will not achieve it. Health is not something that can be bought at the store nor made at the shop. Health must be thought of as an end and as a means for the accomplishment of that which is worth while in life. We can and do often prevent disease. Our vital statistics prove this beyond argument. Diseases, like tuberculosis and syphilis, which cause degeneration of race stock, must be prevented; when existent, they must be controlled. Our race stock has been made by immigration. It can be improved by careful supervision of further immigration and the elimination of the mental and physically unfit.

We must shield the adolescent from alcohol in every form. We must provide substitutes for the "poor man's club," the corner hang out, the club, the saloon, the den. We must develop community interests that add to health, comfort and welfare. There must be prompt, suitable, and adequate punishment to evildoers.

To me, personally, the incidents indicative of the evil consequences of statutory regulation of indulgence in alcohol is but a natural sequence. It was almost prophetic. The committee of fifty scientists reported as an estimate of the percentage of different kinds of indulgers in our population as follows: Abstainers, twenty per cent.; indulge to excess, five per cent.; moderate, fifty per cent.; social, twenty-five per cent.

WHAT PROHIBITION HAS DONE.

1. Prohibition has increased enormously the deaths from wood alcohol.
2. Prohibition has increased admission to general hospitals of cases of alcoholism.
3. Prohibition has made men switch from beer drinking to hard liquor.
4. Prohibition has increased alcoholism in the two alcohol services of our two hospitals.
5. Prohibition has closed the saloon but has made home brewing and occasioned home drinking.
6. Prohibition has increased the wholesale price of grapes, rich in phosphates and vitamines, beyond the price for average home consumption.
7. Prohibition has increased the number of arrests for drunkenness.
8. Prohibition has brought about wholesale disrespect for law.
9. Prohibition has caused poisonous death dealing drinks to be made and sold promiscuously.
10. Prohibition has increased alcoholic indulgence by the adolescent male and female.
11. Prohibition has brought about wholesale bootlegging and illicit peddling of impure liquors.
12. Prohibition has brought an increase in the manufacture of spurious money.
13. Prohibition has brought about "speakeasies" for the sale clandestinely of liquor.
14. Prohibition has many sins, social and hygienic to account for.

These fourteen points are consequences, disappointing in our public health experiences, and are a terrible indictment of such regulation. These facts should make thinking persons consider seriously if this is the right way to deal with the problem. Privileges, that are almost as natural as life itself, being swept ruthlessly away over night, naturally beget an antagonistic reaction which can only be hurtful to a good cause having high aims. Let us reflect.

Editorial Articles

THE MESSAGE OF PSYCHIATRY TO GENERAL MEDICINE

Dr. William A. White in a recent article in *Southern Medicine and Surgery* entitled The Message of Psychiatry to General Medicine gives some wholesome advice and points to some pertinent facts in modern psychiatry. As he states, the path of science leads from the region of the known into the region of the unknown, and study, research and experimentation are necessary and imperative. Whenever a science becomes fixed or final, it ceases to grow, and efforts are spent mainly to uphold and support its established theories, etc. Such has been the case with religion, and until the past decade with psychiatry. But to quote White: "The scientific spirit has invaded the field of psychiatry and in no department of medicine has progress been so rapid or greater strides been made, and today scientific psychiatry, as a medical specialty, is of equal dignity with the other specialties and has attracted many skilled physicians and profound thinkers, yet the majority of medical men realize very inadequately its accomplishments and should be taught by text in journals, and lectures before medical societies its dignity and importance." He admonishes all in studying psychiatry to study the man as a whole—as a total organism, and not merely the brain or mind. The psyche is as old as the soma, and the mind and the body are but different aspects of life itself, and psychiatry has come to realize this concept.

The mind by its ideas, ideals, feelings, emotions, or other symbols represents the tendencies of the individual as a whole—the objects or goals which are desired, or wished to be attained, and the body consists of the machinery by means of which these desires are attained; and the wishes are considerably dependent upon the organic makeup, thus showing the interrelationship of body and mind. White says the habits of life are matters of the mind, and habits materially modify our health, hence correct habits should be early inculcated. Also that organic disorders have their psychological as well as somatic symptomatology, and he gives diabetes as one example in which the patient is suffering from a continuous bombardment of violent emotions, due to the correlation of the emotions with the mobilization of sugar in the body. The mere fact that he does not show violent emotions to the ordinary observer is no more proof that he does not harbor them than that he cannot have a pancreatitis because he does not have a visible sign on the surface.

White says: "If the organism is a unity, if mind is but a name for the functioning of the unity as a whole, then whenever there is any serious organic involvement of part, or parts, of the organism there must be some sort of expression of the trouble in the mind, the psyche; and it will be found if sought for carefully and methodically and with the possible aid of psychoanalysis." We know too little about such large matters as sex, menopause, senility, glandular or endocrine disturbance, metabolism, arteriosclerosis, and the part they play in conditioning various diseases, and psychiatry has something to offer in unravelling these complex problems.

A NEW DISCOVERY

Several discoveries in the sphere of medicine have been made recently. Dr. W. Langdon Brown, of London, one of the first authorities on endocrinology in Europe, writing to the *Lancet,* June 16, 1923, on the question as to whether diabetes mellitus is a progressive disease, holds that it is not so when the proper dietetic measures are used at an early stage of the disease. But in many cases the low caloric value necessary to keep the patient free from hyperglycemia is inadequate to enable him to carry on any tolerable kind of existence and it is here that Dr. Brown thinks insulin comes to the rescue. By its aid the caloric value, especially if derived from protein, fat, and five per cent. vegetables, can be raised to a level compatible with reasonable comfort without producing hyperglycemia. And evidence is accumulating that if insulin is used in this way there is an increase in carbohydrate tolerance. Used otherwise insulin appears to him to be merely an expensive palliative.

Another discovery has just been announced in the realms of socalled vaccine therapy. Professor Georges Dreyer, of Oxford, lecturing on June 14th, at St. Mary's Hospital, London, showed how in some instances bacteria may be so treated by formalin and acetone that their fatty sheath or envelope is dissolved, leaving only a thin part of the body of the bacillus remaining which is not acid fast, is digested more or less easily with trypsin, and will cause the production of various antibodies when inoculated into animals. Prof. Dreyer has pointed out that antibacterial, as distinct from antitoxic immunity, can be obtained better with gram negative than with gram positive organisms, which suggests that the lipoidal substances, on which he believes gram staining to depend, are responsible for the failure of gram positive and acid fast bacilli to arouse an effective response in the body. With these defatted bacteria, it is hoped that results, long vainly hoped for, will be obtained. In fact, experimental animals, seriously infected with tuberculosis, have been cured by the administration of defatted antigen. Moreover, preliminary observations on the treatment of human cases by the same method at the London hospital have been distinctly encouraging. Also, it would seem that other diseases may be dealt with successfully in a similar manner, as defatted preparations have been made with staphylococci, streptococci and other organisms which open a wide field in the therapy of immunology. So far vaccine therapy has met with no striking success either from the viewpoint of preventive or curative medicine and therefore Prof. Dreyer's discovery marks a step in advance; how long a step it is at present impossible to foresee.

Sir Almroth E. Wright has been the chief exponent of vaccination against disease—the pioneer in these methods may perhaps be the more apt term. But he has revised his opinions on the subject, since he set himself to perfect the mode of preventive inoculation against typhoid fever which has been so great a boon to mankind, especially during the years of the war. Sir Almroth has changed his views to the extent he no longer holds that our bodies elaborate a special and specific antidote against each germ which attacks them. He takes the stand that there is stored up in the white cells of the blood a stock of antidotes which can be released with extreme rapidity and which is capable of destroying most of our bacterial enemies. Prof. Dreyer's method of bacteriotherapy, under the specific stimulus of defatted antigen, enables animals infected with tuberculosis to cure themselves or indeed animals infected with certain other disease bearing organisms to effect their own cure.

Medical research has won many triumphs of late and has demonstrated that money spent in this way is indeed money well spent. Perhaps more of the mysteries of disease will be revealed when endocrinology is better known and treatment by glandular products has become a more exact science. A philosopher said the wise man was one who knew how little he knew. The wise investigator is he who is aware of this fact but is always endeavoring to increase his knowledge. The main reason why money is necessary to the research worker is that if he is not free from financial worry and has to work for his living he cannot devote himself with that zeal and wholeheartedness to his work which alone commands success. And further it must be borne in mind that the successful investigator is like the poet, born not made. Pasteur, whose centenary has just been celebrated and who is the father of modern scientific research, is the most striking example of the truth of this statement.

FIFTY YEARS OF HEALTH PROGRESS

In a recent number of *Public Health Reports,* Dr. George M. Kober outlines the several achievements bearing on the conservation of human life and health during the past fifty years. As an introduction to this, he gives a brief history of hygiene and sanitation from the times of the ancient Egyptians, through the plague stricken Middle Ages, down to the achievements of scientific medicine in the present day.

Some interesting figures are given on the life span and mortality rates of the past as compared with the present. It has been estimated that the average length of human life in the sixteenth century was between eighteen and twenty years; at the close of the eighteenth century, it was still less than twenty-five years. At the close of the nineteenth, it was between forty-five and forty-eight years; today it varies in different countries, from less than twenty-five in India to sixty in New Zealand, and fifty-six in this country.

The general mortality rate in the registration area of the United States has been reduced from 19.8 in a thousand in 1880 to 11.6 in a thousand in 1921. This means the saving of about half a million lives for the one year alone. During the year 1875, nearly forty per cent. of all deaths were due to consumption, infant mortality, and smallpox. The death rate from consumption has been reduced from 439 in a hundred thousand in 1876 to 108 in 1922, a saving of approximately fourteen hundred lives for 1922. The infant mortality rate has been reduced from 322 in 1878 to 84.5 in 1922, a saving of about two thousand babies. The typhoid fever death rate has been reduced from eighty-three per one hundred thousand in 1890 to 4.8 in 1922.

These remarkable reductions in mortality rates are due to the fact that fifty years ago we knew little or nothing about infectious or communicable diseases; now we do know a good deal about them. In 1908 it was estimated that about three million persons were sick at all times in the United States, and that forty-two per cent. of this illness was preventable. It was estimated that in 1922 there were two million four hundred thousand continually ill persons and that half the sickness was preventable. During 1917 there were about forty-five thousand fatal accidents, and about 5,625,000 nonfatal injuries caused by public accidents. Probably seventy-five per cent. of this accident rate is preventable.

In closing, Doctor Kober speaks of the fifteen year gain in the span of human life, and declares that he is sufficiently optimistic to believe that, provided we maintain high standards of living and civilization, the average span may reach the biblical three score and ten by 1950. "This, however, can be accomplished only in an uninterrupted period of peace and prosperity; indeed, it is utterly impossible under chaotic political and economic conditions with war and food shortage. We have referred to the sad effects of the Dark Ages on health, and the influence of war and revolution on poverty, famine, and pestilential diseases. God forbid the reenactment of scenes of the Middle Ages, with all the evil consequences on the health, longevity, and happiness of the human race!"

ETIOLOGY AND TREATMENT OF ARTHRITIS

A certain amount of haziness still exists with respect to the etiology of that condition known as arthritis and consequently views as to treatment are not quite so definite as could be desired. Arthritis is a disease which is probably on the increase but is considerably more prevalent in Great Britain than in this country. It is needless to say that there is no more crippling and few more painful diseases known, and it would be to the manifest benefit of the community if its etiology was made clear, as then, of course, treatment would be undertaken on more decided lines than is at present the case.

At a general meeting of the fellows of the Royal Society of Medicine, in London, on April 23d last, the subject discussed was the etiology and treatment of osteoarthritis and rheumatoid arthritis. Sir Archibald Garrod opened the discussion and said in part that chronic articular disease was an obscure branch of medicine, the gross classification and multiple nomenclature of which were sure signs of ignorance. He pointed out that osteoarthritic lesions, erosion of cartilage, eburnation of bone, the formation of osteophytes, etc., developed insidiously in elderly people with a characteristic distribution, quite apart from infective rheumatoid troubles. So far as septic foci were concerned, in the teeth or elsewhere, the part they played was still obscure. Treatment had advanced very little. Drugs generally failed to achieve much. Garrod considered guaiacol carbonate administered over a long period to be most useful. In osteoarthritis drugs were of little use.

Dr. M. Cassidy considered that the importance of infective conditions in the etiology of these diseases, especially in the case of rheumatoid arthritis, had been much overrated. He regarded the latter as a clinical entity, a somewhat uncommon disease and one almost entirely confined to women. Rheumatoid arthritis tended to be hereditary, but Dr. Cassidy's remarks applied only to genuine rheumatoid arthritis. Never in his experience was the relentless course of the disease arrested by extraction of teeth or by inoculation. There was, however, a large group of cases of chronic infective arthritis which might resemble closely the former disease, in which an infective focus was readily demonstrated, and when it was removed gratifying therapeutic results usually followed. He thought that many cases of osteoarthritis were metabolic rather than infective, for instance, those in which the onset in the knees was acute, those with or without Heberden's nodes in the fingers in women at the time of the climacteric. While he was fully alive to the dangers of chronic septic intoxications, perhaps the majority of all cases of chronic polyarthritis were infective, he submitted there were other common, important, and easily recognized types, and he considered it retrograde to lump all these diseases together under the horrible title of nonspecific infective arthritis.

Dr. F. J. Poynton, who holds that he and Dr. A. Paine discovered the cause of rheumatic fever in the shape of a paired coccus to which they gave the name Micrococcus rheumaticus, joined in the discussion. He said that it was over twenty years since he and Dr. A. Paine had demonstrated the experimental production of osteoarthritis with a streptococcus, and rather later they showed experimentally that, 1, the same infection in varying virulence might produce various types of arthritis; 2, that a nonarticular arthritis might result from a blood infection.

The problem of rheumatoid arthritis was unfortunately much more complex. In his opinion it was their lack of knowledge of the life history of infection in the human tissues that was now an obstacle in the treatment of disease. Bowel infection was the most favored theory of causation of the movement. However, he regarded the colitis as an effect rather than a cause of the disease in many cases, and was cautious in advising treatment by colonic douches. Dr. Poynton advocated the employment of vaccines when a pure or almost pure culture could be obtained from an obvious local focus. Organotherapy was helpful in cases at the menopause and those with vasomotor spasm. He avoided the use of radiant heat in cases that were more painful in the summer than in the winter.

It appears to be the general belief that drugs are of little avail in the treatment of arthritis, except in those forms, the gonococcal for example, in which the infective agent is known. The treatment then is to cure the primary infection. In some forms of the disease intestinal antiseptics are advocated. Mouth infection, and especially pyorrhea alveolaris, is not regarded as the chief cause as it was considered a few years ago, and therefore the wholesale extraction of teeth is not now considered to be a *sine qua non* of successful treatment.

PHTHISIS IN THE GRANITE INDUSTRY

The problem of dust phthisis in the granite stone industry has long been of the first importance, from the point of view of both medicine and insurance. Frederick L. Hoffman, LL.D., has completed a detailed study of this problem for the Bureau of Labor Statistics of the United States Department of Labor, which has recently been issued as *Bulletin* 293 of the bureau.

The granite stone workers of Vermont were the subjects of this study. Although these laborers live under sanitary and housing conditions above the average, and are of a superior physique, indicative of a higher degree of resistance, their mortality from pulmonary tuberculosis has increased enormously during the last two years. Every other stonecutting centre of the United States shows the same condition. And this in the face of the facts that the mortality of the population at large is diminishing, and that normally the rate of tuberculosis decreases with increasing adult age. Among granite cutters the death rate from pulmonary tuberculosis at ages of sixty and over "reaches truly appalling proportions, so much so that the statistical evidence would seem incredible if it were not supported by the additional and equally suggestive data for nontuberculous respiratory diseases." These conclusions are in conformity to the observations made in South Africa and Australia.

There are, therefore, clear indications that the cause of this excessive liability to pulmonary tuberculosis is the inhalation of granite dust in a comminuted form of practically ultramicroscopical particles. Unfortunately no autopsy material is as yet available in this country to determine the dust content of the silicotic lung. The evidence is also conclusive that workers exposed to marble or limestone dust are much less liable to pulmonary tuberculosis than those exposed to granite or sandstone dust, with a high silicotic content. There are many reasons for believing that this disease, certified among granite workers as pulmonary tuberculosis, is often not a true form of tuberculosis, but a silicosis or pneumonoconiosis, possibly in its terminal stage complicated by a superinduced tuberculosis. Thus a further conclusion arises that methods of prevention applicable to true tuberculosis will be largely inapplicable to a disease chiefly nontuberculous in origin and frequently in termination. If it is nonbacillary in origin and progress, it cannot be infectious, hence does not constitute a serious menace to adult population.

Doctor Hoffman quotes these, and many other deficiencies in knowledge of the disease, as conclusive evidence of an unfortunate apathy on the part of the medical profession in realizing the difficulties of the question. This industry demands, perhaps more than any other dusty trade, "the utmost and thoroughly qualified consideration on the part of the State, the medical profession, and the labor organizations directly concerned. At the present time the death rate among granite workers is practically the highest known for any occupation of record, and the increase in the death rate from year to year is lamentable evidence of the inefficiency on the part of the health promoting agencies to bring about reduction and control. The problem concerns not only the wage earners, who directly pay a frightful toll in needless deaths and prolonged chronic disease, but the burden also falls, and possibly with crushing weight, upon the industry, which is deprived of skilled workers. The present inquiry should prove of particular value as an indication of new methods by which the facts of industrial health can be determined with practical certainty and at minimum expense. The investigation emphasizes the futility of broad generalizations, in which essential matters of detail are disregarded. . . . The present discussion is intended to reemphasize the industrial aspects of disease along lines of prevention which cannot possibly fail. If the dust hazard is the causative factor in the enormous respiratory disease mortality of granite and other stone workers, and if preventive means are possible by which the dust menace can be brought under control, it is for the State, for the labor organizations, and for the industries concerned to see to it that what can be done about it is done without needless delay."

THE MENACE OF EASTERN EUROPE

The conditions prevailing, at the present time, in Eastern Europe are appalling and constitute a standing menace to the health of the entire civilized world. During the war the state of affairs there was such as to strain the resources and energies of medical men, sanitarians and philanthropists of every description almost to breaking point, to prevent the foul epidemic diseases engendered and developed by filth, from overwhelming Western Europe. It was indeed a triumph for sanitation and hygiene in which Americans played foremost parts, that diseases, some of them imported from Asia, that pest hole of the world, were kept within bounds. It was regarded as a necessary accompaniment of warfare carried on under the conditions which existed, and the real triumph of the war from the medical point of view was as much the successful treatment of wounds and disease as the prevention of epidemics. It was expected that heroic attempts must be made during the war to prevent epidemics and to curtail their spread. The tragedy of the situation rests in the fact that the war has been over for more than four years and yet the conditions of Eastern Europe are a menace to the civilized world. In Poland and nearby countries disease is rampant, but at the present time the principal danger zone is in Greece and to a lesser extent in Turkey, owing to the enforced exodus of thousands of Greeks from places which had been allotted to them by the Allies and from Turkey itself, as one result of the success of the Turkish arms. More than one million refugee Greeks are scattered throughout Greece and naturally when they are not afflicted with epidemic contagious disease, are very susceptible to these diseases, owing to their debilitated state.

In the *Lancet,* March 17, 1923, Sir Patrick Hehir, late major general I. M. S., and an authority on tropical diseases, writes concerning the Greek refugees. At the time he wrote he was traveling in Greece in order to make observations. He points out that the most important measures necessary at the present time are the isolation of all cases of infectious disease and the prevention of the dissemination of these diseases. It appears that cases of typhus fever are sometimes not discovered in refugee camps for a few days after they have become infective. Many of these cases are diagnosed in the early stages as influenza and one group of these wrongly diagnosed cases is said to have infected a whole general hospital. In a few instances individuals suffering from typhus in the preeruptive stage have been discovered walking about with healthy members of camps. Attention is directed to the fact that there seems to be a remarkable difference in the intensity and mortality of typhus in different areas.

It should be mentioned that Sir Patrick Hehir's article is virtually an appeal for help, an appeal, it may be said, to the British, as at present the Americans are taking by far the largest share of this relief work in all its branches. If these people were not helped they would not only die like flies, but they would spread epidemic diseases, chiefly typhus, throughout Greece and probably Eastern Europe, and who can say that the conflagration of disease once well started might not rage over Western Europe and even reach this country. So that it is not only an act of humanity and philanthropy to assist the people of Eastern Europe to fight the diseases attacking them, but a measure of selfinterest to prevent such diseases from spreading far and wide.

The League of Nations is doing yeoman service in Greece. Among other services which its medical representatives are performing is the colossal task of inoculating the whole group of refugees in Greece against enteric, paratyphoid A and B, and cholera, and vaccinating against smallpox. Inoculation against typhus is also being adopted, but as it is more or less in the experimental stage it is voluntary. It is said that there is absolutely no reaction and it is further stated that Dr. George Blanc, *directeur de L'Institut Pasteur Hellenique,* says that he has done thousands of inoculations and has not heard of any inoculated person acquiring the disease, but cannot yet express an opinion as to its prophylactic value.

The object of this editorial is to emphasize the point that conditions existing in Eastern Europe are an indirect menace to the health of the world and that, therefore, it is to the ultimate benefit of everybody that the epidemic diseases rife there should be stamped out, or at any rate prevented from spreading.

CARRIERS OF COMMUNICABLE DISEASES.

In a recent number of the *Public Health Bulletin* on the subject of Communicable Diseases and Travel, Dr. Thomas R. Crowder gives some interesting information on the relation of carriers of communicable diseases. He classifies carriers as active and passive. An active carrier is one who has passed through and recovered from a disease, but who has failed to cast off all of his infecting organisms. In most cases of infectious diseases the patients remain active carriers for a short time after clinical recovery; some remain so for a long time, and a few become permanent or chronic carriers. A passive carrier is one who harbors in his body the virulent organisms of a disease from which he has never suffered any illness—who has become infected, and in whose body the infecting organisms grow, but whose resistance or natural immunity is so high that the infection does not cause development of the disease. Passive carriers are not infrequently found among those who are in close association with an acute case of communicable disease. Like active carriers, they may soon get rid of their germs and return to the normal state; but some continue to harbor and expel dangerous organisms for long periods, and in some instances finally fall victims to the very organisms they have harbored so long without apparent harm. "Although we have not enough evidence to show clearly just what is the relative importance of carriers and of sick persons in the spread of the communicable diseases, there is ample epidemiological evidence that healthy carriers may be the source of well marked outbreaks of some of the most common of them. . . . A practical plan to discover and cure carriers is indeed one of the most urgent needs of sanitary science at this time."

News Items.

Hospitals Observe Their National Day.—National Hospital Day and the anniversary of the birth of Florence Nightingale were observed on May 12th in some of the hospitals either by keeping open house for visitors or by parties for the children.

Curbing Yellow Fever.—Progress in control of yellow fever and hookworm diseases was reported by Dr. George E. Vincent in the second installment of the report of the Rockefeller Foundation, made public recently.

Hospital Care for a Rural Community.—In February last the town of Cuba, Allegany County, N. Y., opened an eighteen bed hospital under the name of the Soldiers' and Sailors' Memorial Hospital. The town has a population of about seventeen hundred.

Hospital Diagnosis Station Transferred.—On July 1st, the Hospital Diagnosis Station, previously located at 128 Prince Street, was transferred to 505 Pearl Street and conjoined with the Corlears Tuberculosis Clinic, under the supervision of Dr. E. L. Creeden, who was designated physicians in charge of Corlears Clinic.

New York City Death Rate.—The death rate for the first twenty-six weeks of the year was 13.55 to a thousand of the population, as compared with 13.71 in the corresponding period of 1922. From January 1st to July 7th seventy-four infants under one year of age died out of every thousand born, as compared with eighty-four deaths in this age group in the corresponding period of 1922, a decrease of ten deaths to a thousand births.

Deaths From Automobile Accidents.—The number of persons reported killed in automobile accidents during the first six months of 1923 was 454, as compared with 458 killed in the first six months of 1922, according to the Bureau of Public Safety of the Police Department. The number of killed showed a decrease, although the number of automobiles in the city had increased. The decrease in fatalities was believed to be largely due to the safety campaign conducted by the bureau among children and drivers of automobiles.

Civil Service Examination for Assistant in Neuropsychiatry.—The United States Civil Service Commission announces an examination to fill a vacancy in the Public Health Service, Boston, Mass., at $1,800 a year, plus the increase of $20 a month granted by Congress; a vacancy in the position of special assistant in neuropsychiatry, Veterans' Bureau, New York City, at $1,800 a year, and vacancies in positions requiring similar qualifications throughout the United States. The receipt of applications for this examination will close August 21st.

Health Scholarships.—A fund of $25,000 to be used as scholarships for teachers best fitted to promote health work in the schools has been donated by the Metropolitan Life Insurance Company, through the American Child Hygiene Association. There will be fifty scholarships of $500 each. Announcement is made that fifteen scholarships have been awarded to teachers who will take summer courses in child health education. Applications will be received by the American Child Hygiene Association up to December 1, 1923.

Negro Death Rate.—The mortality rate among negroes in the United States now is seventeen in a thousand according to statistics collected by Howard University. The figures further show that colored physicians and surgeons have increased 23.7 per cent. in the last ten years.

Royalty to Honor Rockefeller Gift.—As a result of the gift by the Rockefeller Foundation of £1,205,000, the largest sum ever given in England for educational purposes, the University College Hospital will possess the finest laboratories for scientific medicine in England, a thoroughly up to date maternity hospital with sixty beds, and additional medical and surgical wards with 120 beds. The King and Queen will lay the foundation stone of the new hospital buildings and will declare open the new medical research building.

Howard University Endowment Fund Completed.—Announcement is made that the campaign of Howard University, under the jurisdiction of the Department of the Interior, to raise $250,000 to make up a $500,000 endowment for its medical school, half of which was pledged by the General Education Board, has been a success, and an additional $15,000 has been contributed.

Free Dental Clinic Opened in New York.—A free dental clinic, equipped to perform all services from prophylaxis to operations, was formally opened at 327 East 149th Street, under the auspices of the Northern District Dental Society. School children who cannot afford to pay the regular cost of professional services may apply for treatment at the clinic. Four dentists and a trained nurse will be in attendance at all times, the 320 members of the society having volunteered their services free of charge. Five departments have been inaugurated in the clinic, in which demonstrations will be given at regular intervals for dental students. Dr. S. Maggin is chief of the fillings department; Dr. A. Kuntz, chief of prophylaxis and pyorrhea; Dr. M. L. Rosoff, of oral surgery; Dr. M. L. Berger, of x ray, and Dr. S. Herder, of orthodontia.

Personal.—Dr. William Allen Pusey, of Chicago, was elected president-elect of the American Medical Association, at the annual session held recently in San Francisco.

Dr. George A. Soper has been made managing director of the American Society for the Control of Cancer.

Dr. Frederick M. McPhedran, of Toronto, has been appointed assistant in clinical research of the x ray department of the Henry Phipps Institute in Philadelphia.

Dr. Paul A. Lewis, of Philadelphia, for thirteen years director of the laboratory of the Henry Phipps Institute of the University of Philadelphia, has accepted a position at the Rockefeller Institute, Princeton, N. J. He was given a farewell dinner on June 18th by the staff of the laboratory.

Professor Franz Boaz, anthropologist of Columbia University, has been elected to corresponding membership in the Academy of Sciences at Vienna.

Dr. William Darrach, dean of the medical faculty of Columbia University, will represent Columbia University at the celebration of the centenary of the birth of Joseph Leidy, the American naturalist. The meeting will be held in the Academy of Natural Sciences, Philadelphia, on December 6th.

AIX-LES-BAINS

Ancient and Modern

By B. Sherwood-Dunn, M. D.,
Nice, France,
Officer d'Académie, corresponding member Société Obstétrique et Gyynécologique de Paris, Ex-Colonel Medical Corps of the Army.

HISTORICAL.

Aix had its origin in the days of the Allebrogia and the first historical designation was Aqua Allobrogorum, long before the Christian era. The beginning of the present bathing establishment was made when the Roman Consul Domitius, in 122 B. C., built his baths, the ruins of which are still to be seen, from which time the place was given the name of Aqua Domitiana.

Southeastern Gaul (France) was under Roman dominion before the time of Cæsar and it was only after the second expedition of the Roman Legions, in response to the second appeal from the city of Massillia, the modern Marseilles, for aid against neighboring tribes (125 B. C.) that Rome retained her conquest and formed a new dependence between the Rhone and the Alps, later called Provence.

Sextius founded the town of Aqua Sextia as its capital. Soon the Allebroges who occupied the territory now known as Savoie and Dauphine, were conquered, and finally the whole district watered by the Rhone, as far north as Lake Geneva, became an organized dependence of Rome (118 B. C.).

This Transalpine province formed an advanced outpost from which the Roman Senate held in check the tribes of Gaul, forming a base of operation, from which Julius Cæsar finally conquered the whole country, bringing it under the Roman dominion (50 B. C.). She continued the control about five hundred years, which accounts for the numerous arches, ruined temples, and other Roman relics found throughout all of France today.

The earliest records of the Franks, the ancestors of the French, is about two hundred years before the fall of Rome, when they began crossing from the east to the west bank of the Rhine, and settling in what is now Belgium and Northern France.

Their first dynasty was the Merovingian, founded by Meroveus, a king who took part with the Visigoths, Franks and Romans under command of Aetius, in the battle of Chalons (451 A. D.), which was one of the fifteen decisive battles of history. This battle overthrew Attila and his barbarian Huns. and saved civilization to Europe.

Charlemagne was the greatest of all French kings, and on Christmas Day, 800 A. D., was crowned by the Pope in St. Peter's, Rome, Emperor of the Holy Roman Empire, comprising all of Continental Europe. Had he wisely divided up his vast territory, many of the modern wars might have been avoided.

With the dismemberment of the Empire by the Treaty of Verdun, Savoie, in which province Aix-les-Bains is situated, was included in a strip of territory given to his son Lothaire, who was then King of Italy, and it thus became a part of Italy; and has gone back and forth, in its history, between Italy and France, a good deal as Alsace-Lorraine has gone back and forth between France and Germany.

The descendants of the House of Savoie were successively counts, then dukes, then kings of Sardinia, and finally in the nineteenth century kings of Italy and rulers of Savoie.

Not to go too much into the details of history, Savoie, in 1792, during the French Revolution, became a part of France. The majority of the Savoyards were in sympathy with the principles for which the French Revolution stood, and on September 24, 1792, General Montesquiou took peaceful possession of Chambery, the capital of Savoie, and that province remained a part of France for twenty-three years, until the overthrow of Napoleon I, when it again became a part of Italy.

When the Emperor Francis Joseph of Austria invaded Italy, in 1859, he found himself confronted by Napoleon III at the head of a French army. By the combined forces of Italy and France he was promptly defeated, and as a reward for this assistance by the Treaty of Turin, March 24, 1860, Savoie and Nice were ceded to France.

In the fifth century vandalism destroyed many of the old Roman monuments and nothing is known of the history of Aix during the Dark Ages. In the thirteenth century Aix was destroyed by fire and when reconstructed was made into a barony, and in the sixteenth century into a marquisate, when the chateau was built, that is now in use as a Town Hall. In 1776 the King of Sardinia laid the cornerstone of the present Thermal Establishment and inaugurated the era of prosperity that has never ceased.

In recent times it has been a favorite resort of many of the crowned heads of Europe: Victor Emmanuel II, Napoleon III, Queen Victoria and her daughter, Princess Beatrice, Queen Wilhelmina of Holland, King Leopold of Belgium, King George of Greece and Marie, Queen of Roumania.

This resort was discovered to the Americans by Mr. J. Pierpont Morgan, who frequented it regularly, and it was in memory of his favorite physician that he gave the money for the erection of the American Hospital, situated upon the boulevard that bears his name.

SITUATION AND CLIMATE.

The situation of Aix-les-Bains is one of idyllic beauty. It rests in a verdant valley on the border of Lake Bourget, surrounded on all sides by lovely hills and majestic mountains. The town is protected on all sides from the cold blasts of winter, and its elevation of 850 feet renders it free from oppressive heat in summer. On the plain below may be seen fields of grain and artificial gardens, and on the sides of the hills, exposed to the sun, are extensive vineyards.

Along the borders of the lake the fig tree grows in the open air, and experiments in the acclimatization of southern flora have succeeded admirably, proving better than any meteorological instrument the mildness of the climate. This is important for those coming in the spring time from a winter on the Riviera, desirous of taking the cure at Aix en route to Paris. It is a curious fact that the valley of Aix has never been subject to any sort of epidemic and is singularly free from endemic diseases. In the sixteenth century, the Senate removed from

Chambery to Aix to avoid an epidemic that was ravaging that part of the country.

Unusually large sewers were built to insure the tremendous outflow of water from the bathing establishment which keeps them constantly flushed, and is completed by bacterial purification by the Calmette process. In every respect the sanitation is exceptional. The streets of macadam are covered with odorless tar oil at regular intervals, and a force of street sweepers and water sprinklers are constantly in evidence; there is no dust and I must say it is uniformly the cleanest city I have ever seen.

Aix is on the great international railway line from Paris to Italy; and Calais-Brindisi, being nine hours' distant from Paris, with every modern comfort of traveling by *trains de luxe*. The town lies at the foot of Mt. Revard, which towers 4,305 feet above the summit of which can be reached by a funicular railway in one hour. I shall speak later of the relation of this mountain to the hot springs.

Aix is the greatest touring centre of the French Alps. It is served by excellent roads radiating in every direction, and is the pivot of sixty-four different excursions, all of them beautiful and captivating because of the beauty and grandeur of the scenery. It is sixty miles to Chamonix by the *Col des Aravis,* fifteen miles to Annecy and its beautiful lake, twenty-five miles to the celebrated convent of the Grande Chartreuse, and thirty miles to Grenoble.

At times it is useful to join a climatic cure to the Aix treatment, and it is admirably situated for this purpose. Across the lake, part way up the mountain of the *Dent du Chat,* is the Hotel *Col du Chat,* 1,400 feet above sea level, managed by a man from the Hotel Ritz, New York. Going up Mt. Revard, by the funicular railway, we come to Pughy Corbières, 2,000 feet, with a fine hotel; on the top of Mt. Revard, 4,000 feet, another.

Motor boats convey visitors on a tour of the Lake Bourget, the largest lake in France. The first point of interest is the Abbey of Hautecombe, one of the most beautiful church interiors I have ever seen, and as a monument, a unique and curious anomaly, for the building, dating from 1125, and the surrounding park, here in the middle of France, belong to the State of Italy, and were ceded by special treaty, for the reason that the church for centuries was the burial place of the House of Savoie, of which the reigning King of Italy is the head; and the delicate consideration of the French found a way to permit this property to remain under the dominion of the House of Savoie, and it is supported out of the privy purse of the King.

SPORTS AND AMUSEMENTS.

In the square facing the bathing establishment, there stands out conspicuously the Arch of Campanus, built in the third or fourth century. On the architrave can still be deciphered:

L. POMPEIVS CAMPANVS VIVVS FECIT.

A few hundred feet distant stands the Temple of Diana, built probably at the epoch of the Domitian Baths (122 B. C.). It is in a fine state of preservation and with additions made to it, forms the city museum, where are gathered many relics of great antiquity found in the neighborhood.

In the fifth century, the Vandals destroyed many of the most important of the Roman monuments, but upon entering the museum one sees the broken walls of the Temple of Diana, thirteen feet in thickness, formed of huge blocks of stone superposed, one above another, without mortar, and can readily comprehend why this massive monument was left standing.

Adjoining the temple is the chateau of the Marquis of Aix, built in the fifteenth century, and now occupied as the Town Hall.

At the right of the Thermal Establishment across the street is the Hotel Chabert, which is built over the old Domitian Baths.

At first this strikes one as being an example of vandalism, but upon consideration it nay not be a bad arrangement, for the remains of these ancient original baths can be visited in the basement, and the building covering them protects and preserves them from the elements. There are a number of brick columns in fine state of preservation, the bricks bearing the name of a well known manufacturer of the period, Clarianus.

There are two casinos, the Grand Cercle and the Villa des Fleurs. The first, one of the finest in Europe, with a magnificent interior housing, the opera, theatre, restaurant, dancing club and gaming rooms, library and writing rooms, and Punch and Judy Show.

The Villa des Fleurs, in a splendid park, has an open air theatre, café, dancing, restaurant and games. Saturday nights a fireworks display is given in the park.

The management provides a variety of entertainments during the season: Dog show, horse show, pigeon shooting, banquets, and on July 4th and 14th an annual procession of native costumes.

There are daily concerts and a celebrated orchestra gives classical concerts in the Casino theatre. In July the horse racing attracts the famous French stables in competition for the important purses and marks the height of the season. An annual regatta takes place on the lake for important prizes, and there is a yacht club, fishing club, and a fine park bordering the lake.

Six of the finest tennis courts in France are found here with a club house which is a favorite rendezvous for the younger set.

There is a commodious and attractive golf club, much frequented for afternoon tea. It is finely situated; has a course of nine holes, and there is a charming view of the surrounding mountains.

Aix possesses the most sumptuous hotels in the world, and it is frequented by the wealthiest and most aristocratic class of any thermal resort in France. There are also very moderate priced hotels and boarding houses.

Mr. Maurice Blake, an American college professor, has purchased and built a camp for boys on the border of the lake, named Camp Bourget, which is already a pronounced success.

MEDICAL.

The bathing establishment has been enlarged from time to time until, in size, it is the second largest in the world.

There are over two hundred employees, ninety of them being masseurs and masseuses, who are chosen from the men and women of the province, and the appointment is handed down from generation to generation. They have a universal reputation as the most expert in massage in existence.

The various departments of the establishment comprise twelve douche rooms with one attendant each (masseur or masseuse), thirty-four douche rooms with two attendants each; seven local douche rooms; four vapor bath rooms, with separate douche room; twelve vapor bath rooms with douche, known as bouillon; three hydrotherapeutic rooms with plunge bath and hot chamber; circular douches, spinal douches, shower baths, sitz baths with douche, six swimming baths; two very large for family use, an inhalation room where the hot sulphur water falls as rain into a central container filling the room with vapor in which the patient sits at ease; two rooms for spray treatment for nose and throat with twelve compartments each; two enteroclysis rooms (high enema); thirty-seven bathrooms of which nine communicate with douche rooms, permitting a bath before or after the douche massage; four submarine deep baths, where the patient sits in an armchair and is lowered into the plunge up to his neck; four baths fitted to give the vaginal douche; two rooms for foot baths in running water; a room for gargling treatment, and two fountains for drinking from the sulphur spring and the alum spring.

These two springs come from the Urgonian calcareous layers of Mt. Revard, by passages that are 160 yards apart. The temperature of the terrestrial layers rises one degree for every ninety feet.

Mt. Revard is 5,070 feet above the sea; these springs arising at the level of Aix have a constant temperature of 113° F. for one, and 115° F. for the other.

The characteristics of the waters are:

1. The presence of free sulphurated hydrogen, and the alkaline hyposulphites.
2. A preponderating quantity of calcium, magnesium, sodium, and aluminium sulphates.

The water is remarkable for whitish, flakey, threads called baregine, a fatty, unctuous, organic matter that acts like a soap, so the hands of the masseur pass easily without dragging or pulling and it is this element that renders the massage so wonderfully superior to all others.

Until 1857 the water issued from the mountain side in the rear of the establishment by seven streams. Italian engineers decided to unite these streams. First they took soundings, then made an excavation into the side of the mountain to an extent of 200 feet, when water burst forth, drowning two workmen and flooding the town.

This tunnel has been transformed into what is now known as the Grotto, and is open to visitors at fixed hours. One can see the great volume of water flowing in a cement conduit, and at the deepest end the great "pot holes" worn by the turbulent action of the water and which burst out upon the workmen as related.

The two hot springs flow in excess of 1,000,000 gallons per diem. A third cold spring that arises in the establishment flows an equal quantity and serves to cool down the douche to the temperature prescribed by the doctor, in each case.

In the park, in front of the establishment, are the kiosks of two cold springs: the Deux Reines and St. Simon. The first, of water similar to Evian, the other similar to Contrexeville. These waters are prescribed in cases where it is desired to create a diuresis or to flush the intestine, as adjunct to the baths.

The treatment at Aix is chiefly external: its application is shown in the following table:

PRIMARY INDICATIONS.

1. Chronic articular and atonic gout. Articular gout, after the acute attack has subsided. Socalled rheumatic gout, along with their neuralgic and muscular manifestations. Sciatica and lumbago.
2. Chronic rheumatism, monoarticular, or polyarticular, or muscular.
3. Sequelæ of acute, or subacute articular rheumatism, attached to infectious and pseudorheumatic (gonorrheal) arthritis, including certain forms of tuberculous rheumatism.
4. Joint affections of traumatic origin. The sequelæ of acute arthritis. Hydrarthrosis with stiffness, or commencing ankylosis. Periarthritis. Arthrosynovitis and tendinous synovitis, consequent upon dislocations, fractures and operations, complicated or not by trophic disturbances, edema and thickening.
5. Neuralgia of diathetic origin, or *a frigori;* Sciatica, cervicobrachial neuritis, professional cramp. Peripheral neuritis of alcoholic origin and otherwise.
6. Adjunct to the intensive mercurial treatment of syphilis.
7. Arteriosclerosis.

SECONDARY INDICATIONS.

1. Polyarthritis deformans in its early stage.
2. Sequela of hemiplegia, spinal paralysis.
3. Locomotor ataxia at a stage where specific treatment is indicated.
4. Sequelæ of phlebitis with hard edema and functional impotence of limb owing to stiffness of joint and muscles.

CONTRAINDICATIONS.

1. All forms of tuberculosis except the first stages of pulmonary.
2. Acute inflammatory disease of the joints.
3. Neuralgia accompanying organic disease.
4. Renal insufficiency in arteriosclerosis, arthritics with cardiorenal complications.
5. Gallstones.
6. Noncompensated cardiac disease.
7. Menorrhagia at the menopause.

The essential treatment at Aix is the douche massage practised under the continuous flow of hot sulphur water. It may be general, or local and supplemented by the steam vapor, needle spray, submerged bath, steam box bath, and swimming pools.

Dr. Daquin relates that the practice of massage was learned by the medical men with the army of Napoleon in Egypt, and brought to Aix by them; so it is only about a hundred years old.

Visitors coming to Aix for the treatment see almost immediately that it is much more detailed and important than the hydropathic treatment elsewhere.

The massage in combination with the unique composition of the waters, acts not only upon the skin, but also upon the subcutaneous tissues, the lymphatics and blood vessels. These factors working in combination produce a marked physiological result, which has been proven upon both healthy and affected subjects.

1. During the period of treatment the urine decreases in quantity and the total urates are so noticeably increased as to demand at times a diuretic water to facilitate the eliminative process.

2. The mineral and organic residuum is augmented and there is a progressive elevation of the coefficient, in relation of the total mineralization to the mineral residuum.

3. We find an increased nitrogen and sulphurous oxidation as shown by the rise in relation to nitrogen to urea, and in the acid sulphates to the total of sulphur.

4. We find a diminution of organic phosphorus, while there is only slight variation in the phosphates.

5. Increased elimination of uric acid.

6. In diabetic, gouty, phosphatic and rheumatic subjects we encounter a decrease in sugar and phosphates.

These interesting experiments in urinalysis show a profound modification in the nutritive processes, and make clear the pronounced action for good in rheumatic and gouty subjects.

The question often arises, is the Aix treatment admissible in arthritic subjects with cardiac complications.

Innumerable observations have demonstrated that the douche massage treatment lowers arterial tension with resultant alleviation of heart symptoms.

The douche massage promotes interstitial absorption in the tissues, which accelerates the movement of lymph in the vessels. It also increases the elimination of organic detritus and renders soluble the salts which form gouty deposits in the muscular and fibrous tissues.

Some patients criticize the treatment as producing nervous manifestation: this only happens when the patient foolishly tries to hasten the cure by taking the baths too frequently, or inducing the masseurs to give them a more energetic treatment. The treatment can be applied so as to secure a sedative or stimulating result; and this emphasizes the fact that the treatment should be followed only under the care and direction of one of the attending physicians.

The special influence of the Aix water is shown in an immediate and marked improvement, but shortly the patient complains of fatigue, heavy and sleepy feeling, with at times an increase in his pains; sometimes there are sensations of prickly heat and slight evidence of urticaria. These symptoms vary in patients, but are quite constant. The amelioration is sometimes constant from the outset, but most frequently toward the close of the treatment, and it is not unusual for the subject to find the maximum of benefit one, two or three months after.

Rheumatism is the condition that is most markedly benefitted at Aix, and experience proves that it requires several seasons of regular treatment to accomplish a cure; but there are instances of a complete cure in one season.

AUXILIARIES TO THE TREATMENT.

At a short distance, from the establishment is the Marlioz Spring, a cold sulphurous, alkaline, iodized, radioactive water. A completely equipped building is devoted to the treatment of eye, ear, nose and throat diseases. There are rooms for cold and hot spray applications, two large salons for dry inhalation of the products of the spring, gargling room, cold douche room and bathing rooms, with warm and cold douches. There are rooms set apart for those who desire private treatment.

These waters are specially indicated in lymphatic children and those of a scorbutic diathesis, and have produced good results in arthritic skin diseases.

The Zander Institute is worthy of special mention: it has the most completely equipped electrotherapeutical and mechanicotherapeutical installation in France.

BULLET WOUNDS AND THEIR CONSEQUENCES.

Dr. Manninger, a Budapest surgeon, read a paper at the medical union of Vienna on bullet wounds in relation to humanitarian warfare, in which he stated that in the recent war the Serbians and Italians used old style rifles, which were, however, excellent as regards the safety of the rifle carriers. Their bullets were of larger size and higher velocity than those of the Russians. Moreover, the Russian bullets were pointed, and penetrating wounds caused by them healed very well, whereas the Serbian, Austro-Hungarian, and Montenegrin bullets were very destructive of tissue. No tissues could withstand the impaction or in any way deviate the course of the Russian bullet; the wound is usually so cleanly incised that no pieces of clothing are carried in. The bone is rarely splintered, except in cases where shrapnel is used. The bloodvessels were very often injured, and Dr. Manninger reported several cases of aneurysm of the popliteal as well as of other arteries. Many of the nerve trunks were attacked. Although these wounds usually healed easily and without reaction, meddlesome examinations were sure to react unfavorably on the course of healing. Pus appeared only in those cases, where the tissues around the path of the bullet were invaded. Another complication arose from the frequently large cicatrices and tough adhesions. Out of 496 gunshot wounds there were twenty-seven cranial, twenty-one being through the substance of the brain. Deep penetrating lesions in this region were not accompanied by any destruction of the bones of the skull; the latter was observed only in superficial wounds. Six of the cases were accompanied by paralysis of the arm and leg; two presented the symptoms of cortical epilepsy evidently due to pressure and removed by operation. The general results of wounds of the lungs were rather favorable, all of them, with two exceptions, being penetrating. There was hemoptysis in twenty-two; subcutaneous emphysema in four, and extensive hemothorax in one, Dr. Manninger had observed forty-three cases of abdominal trauma, all of which were penetrating wounds; of these only five were fatal, chiefly owing to neglect of treatment; one death was caused by peritonitis. There were several penetrating wounds of the liver, spleen and kidneys.

Book Reviews

SYPHILIS.

Syphilis. By Burton Peter Thom, M.D. Illustrated with Sixty-nine Engravings. Philadelphia and New York: Lea and Febiger, 1922.

The author and publishers have combined to produce an interesting and easily readable volume on the subject of syphilis. It cannot be said that there is a crying demand for new volumes on this subject, and it must be admitted that much of the work of recent years has not been of much constructive value. As a rule, works on syphilis really are nothing more than compilations of the literature on the subject, the more pretentious volumes usually representing a deeper delving into the files.

While, therefore, the book under review is well written and printed, one is inclined to feel that it simply represents another book on a subject that has been almost done to death from a literary viewpoint. The book begins with the usual history of syphilis and continues along the usual lines to the end of the subject. The author has nothing new to offer, except several interesting chapters on the law, life insurance, and industrial efficiency in their relation to syphilis, and a brief chapter on how a syphilitic clinic should be managed.

The illustrations are excellent, the typography all that could be desired. On the whole, the author is to be commended for having crowded so much of what is known about syphilis within the covers of a volume of five hundred pages.

UROLOGY

Lehrbuch der Urologie mit Einschluss der männlichen Sexualerkrankungen. By Dr. Leopold Casper. Fourth Edition with 225 illustrations (some colored) and two colored plates. Berlin and Vienna: Urban and Schwarzenberg, 1923.

Casper has covered the entire subject of urology and male sexual diseases in this one volume of six hundred pages. Beginning with methods of examination, the author takes up the various portions of the genitourinary tract, and concludes with a thorough discussion of the functional disturbances of the sexual apparatus in the male.

The German approach to the subject of urology is maintained throughout the work, and to the German reading urologist or general practitioner, the volume will be found thorough, painstaking and concise in respect of detail and statement. In a work of such magnitude by so distinguished a surgeon, it is manifestly difficult and obviously useless to pick out what seems to be especially good or the contrary. Casper stands preeminent as Germany's leading urologist and his teachings may be accepted as representative of the thought of the day in his country on the subject of urology.

While we differ materially in many of these teachings, the difference is more often academic than real; nevertheless, it is well for the American urologist to know the German viewpoint and compare it with his own. In the main there will be found little opportunity for difference of opinion. Casper's latest work can be recommended unhesitatingly as a most valuable contribution to urologic literature by a master.

MICROBIOLOGICAL TECHNIC

Handbuch der mikrobiologischen Technik. By Dr. Rudolph Kraus and Dr. Paul Uhlenhuth. Band I, 2 Hälfte. Mit 83 Textabbildungen und 2 Tafeln. Berlin und Wien: Urban and Schwarzenberg, 1923.

The second half of volume I comprises nearly three hundred pages devoted to the preparation of media. In this there is nothing strikingly original. The formulæ are all copied from the original articles, and in general reasonable care has been given to the assignment of names, though it is obvious that where any question arises, the Teutonic, rather than the American, originator is mentioned. On the whole, there are a good many valuable technical methods that have come from this country concerning which no mention is made, for example, the special media for the differentiation of pneumococci so widely used in America are omitted. It is also strange to note that though Lister is stated to have used the dilution method for isolating organisms, the name of Pasteur is not mentioned in this connection. Except for such local peculiarities this volume forms a useful summary of the formulæ for most of the generally used culture media.

COLLECTED PAPERS

Collected Papers. From the Washington University School of Medicine. Volume I, 1921. St. Louis: C. V. Mosby Company, 1923.

The present volume of collected papers from the Washington University School of Medicine is the first of a series of annuals which are to be published under this title. The papers represent the work done in the Barnes and St. Louis Children's Hospitals, Dispensaries, and Laboratories of the School of Medicine and the Barnard Free Skin and Cancer Hospital covering many subjects and methods. An endeavor has been made to give the volume an interest which would be predominatingly clinical. Among the papers that have been reprinted are those of Wilson and Herrmann on Incomplete Bundle Branch Block, of Sachs on Brain Tumors, of Marriott on Nutrition in Infancy, of Shaffer on Antiketogenesis, of Opie on Tuberculosis Infection, and of Erlanger on Blood Volume and Its Regulation. Many other papers of value are to be found in this collection.

ARROW POISONS

Die Pfeilgifte. Nach eigenen Toxikologischen und Ethnologischen Untersuchungen. Von L. Lewin. Mit 75 Abbildungen im Text und einer Tafel. Leipzig: Verlag von Johann Ambrosius Barth, 1923.

This book contains the results of experimental investigations on arrow poisons stretching over a period of thirty years. It is a comprehensive work on toxicology and ethnology and includes a study of the poisoned weapons used by the aborigines of Europe, Asia, Africa, and America. The different poisons and weapons used by the various tribes are carefully described. The significance of this study lies in the facts that these poisons are still being used against both animals and man and that it has robbed the poisons of the mystery surrounding them; some of the poisons have even been utilized for therapeutic remedies. Such a work is of interest to the physician, the student of natural sciences, the ethnologist, psychologist, the student of the history of civilization and to every cultured person. The collection of this extensive material makes the future study of this subject easier. The symptomatic treatment of poisoning by arrow poisons is outlined.

PERSONALITY

George Gissing. An Appreciation. By May Yates. Manchester University Press. New York: Longmans, Green and Co., 1922.

George Gissing, the man, as he himself expressed himself. There is a danger in this sort of study of reading too much of the writer's character into his mouthpieces. A fascinating subject, however, to trace the notes of Gissing himself ringing through the network of many characters that he projected. And Miss Yates, we believe, has checked the romantic urge and stuck to authenticated facts. What we know from her we know for a certainty. The views Gissing held, his feelings, the all too few contacts of this thinker with the world of human friendliness are laid before us directly, simply. We can see more penetratingly into that complex personality; as far as can be, we know Gissing better for this sympathetic little work.

Medicoliterary Notes.

The Causation of Industrial Accidents is the title of an article by H. M. Vernon in the May number of the *Journal of Industrial Hygiene.* Another interesting article in the same number is Practical Mental Hygiene in Industry, by F. W. Dershimer.

* * *

The Devil's Disciple, by Bernard Shaw, which is being presented by the Theatre Guild, is a most entertaining play conceived by its author with truly Shavian psychology and philosophy. The company, too, is excellent, although perhaps Basil Sidney as the hero does the only outstanding piece of acting.

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The United States Children's Bureau has recently issued as *Publication* 112 the results of an interesting and practical field study in Gary, Ind., of infant mortality.

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Evolution and Religion, a small book by Henry Fairfield Osborn, replying to William Jennings Bryan's socalled fundamentalist views, has recently been brought out by Scribner's Sons.

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The issue for June 1st of *Public Health Reports* contains a full index of the State tuberculosis laws, compiled by James A. Tobey, of the National Health Council, Washington, D. C.

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The Advisory Committee on Health Education of the National Child Health Council has recently issued as the first number of its series, *School Health Studies,* a report entitled *Health for School Children.* The study is published by the United States Bureau of Education.

* * *

The story of the latest scientific expedition, headed by the naturalist, William Beebe, in the steam yacht *Noma,* to the Galapagos Islands off the west coast of South America, will be told by Mr. Beebe in book form. The title of the work will be *Galapagos—World's End,* and it has been announced for publication in the autumn by Putnams.

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Frank R. Stockton's *The Casting Away of Mrs. Lecks and Mrs. Aleshine* has been a steady seller ever since it was first published by the Century Company in 1886. The present illustrated edition was first issued in 1892, and it was recently reprinted for the tenth time. Over a thousand copies were sold last year. This was the first novel ever published by the Century Company.—*New York Times.*

* * *

The *Journal of Social Hygiene* for May contains an article by J. S. Lawrence on the New York State venereal control program.

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The Plymouth Congregational Church of Seattle, Wash., has opened a medical and psychological clinic in cooperation with some of the physicians of the city and the staff in psychology of the University of Washington. The clinic will in no way resemble, it is announced, the late Emmanual Movement of Boston, for the clergy will have nothing to do with the treating of the patients.

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The recently published annual report of the New Jersey State Hospital at Morris Plains announces that the new psychiatric reception building for four hundred patients has been constructed and will be ready for occupancy as soon as the equipment has been installed.

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Among June publications which should be of interest to the psychiatrist are the *Psychology of Laughter,* by J. Y. T. Greig, which will be issued by Dodd, Mead & Co., and the *Story of the Development of a Youth,* an autobiographical study, by Ernst Haeckel. Two publications announced for the fall by Brentano's promise to be fields for personality study of abnormal types—a translation of Marcel Proust's *Les Don Juanes,* which is a psychological study of the female Lothario, and Rafael Sabatini's *Life of Cesare Borgia.*

* * *

The present Status of Sanitary Engineering is the title of an informative article by Harrison P. Eddy, in *Public Health Reports* for April 20. Mr. Eddy's discussion includes modern methods of water supply and purification, of sewerage, drainage, and the disposal of waste, refuse collection and disposal, eradification of the mosquito and infection carrying vermin, and air supply and purification.

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France, as a crowning tribute to Louis Pasteur, the centenary of whose birth has been celebrated this year throughout most civilized countries of the world, has placed his portrait upon a new ten centime postage stamp.

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The New York State Department of Health has published a very full special report on mortality from influenza in the State during the great epidemic of 1918-19. The author of the report is Dr. Otto R. Eichel, director of the division of vital statistics.

Practical Therapeutics

THE USE OF DYES IN ULCERATIVE COLITIS

By Anthony Bassler, M. D.,

New York.

The term ulcerative colitis is employed to describe a group of conditions in which persistent diarrhea of fluid feces with the passage of blood, pus and mucus have been existent for a considerable length of time. With this, ulceration in the sigmoid and upper rectum and evidence of congestion and inflammation must be observed, a high pyogenic bacterial content in the gut proved, a reduction of general health, and subjective symptoms of irritability of the colon. In these conditions syphilis, tuberculosis, and parasitic infections, etiological neurological factors, dietetic indiscretions, conditions in which the colon has a friable mucosa, and simple nonulcerative biological errors are all excluded. The type of cases I am speaking of may be best designated as infectious colitis with ulceration, but the old term ulcerative colitis is more generally accepted.

For a status of illness that is common enough, and has been for centuries, this trying disorder is too little understood and is rarely treated except by rest in bed, a milk or bland diet, fractional doses of castor oil, salol and opium, bismuth, colonic irrigations, and surgery. The severe and difficult cases comprise those in which simple methods of treatment have been employed, or no treatment at all, and perhaps those in which the patients have not got well in spite of the methods employed. Analysis of these conditions shows that the majority of these infections disappear in a relatively short period of time. In a small percentage of cases, however, the infection persists and finally becomes mucosal, remaining as a mixed infection not always easy or possible to define in specific or symbiotic ways. In cases in which the condition has been standing for at least one year without abatement of symptoms which have been studied and treated, some rather worthwhile results have been accomplished through the use of various dyes. Unfortunately there is so much variation in biological ways and even in identical infections with the same dye that it is difficult to present a definite narration of experience. Rather than to complicate it with confusing conditions, I shall offer a simple classification for the finding of etiological causes easily carried out in any laboratory as a guide in the selection of dye that has most often answered.

In a case representing the symptomatology mentioned, a stool specimen is gram stained in a differential way and the gram positive and negative organisms counted as one would leucocytes. One third gram positive and two thirds gram negative are taken as the standard of normal and departures one way or the other from this may classify the case for dye selection. This simple classification answers in perhaps eighty per cent. of the cases, a large enough percentage to be practical for the average worker.

All of the ordinary pyogenic streptococci and staphylococci are gram positive, this being one of their laboratory characteristics for identification. The organisms of the coli-dysentery-typhoid group are all gram negative and among these the semiparasitic Bacillus coli is most often met with. The organisms mentioned are the factors in about four cases out of five and if one can work intelligently with them, the dyes can serve a useful purpose. The smaller percentage of infections, which usually are mixed, require careful laboratory study and agglutinizing reactions for significant identification, and not wishing to confuse a picture that anyone could carry away and a simple procedure that anyone can carry out, they are not incorporated in this article.

MERCUROCHROME 220.

This has been used in the gastrointestinal tract. The compound contains from twenty-three to twenty-four per cent. of mercury in organic combination with the dye molecule. In this form the mercury, while retaining most of its germicidal value, does not show the chemical reactions of the mercury salts, that is, is not precipitated by alkali or ammonium sulphide, nor does it precipitate protein, and because of this fact concentrated solutions are supposed to be harmless. It must thus be plain that this substance does not depend upon its dye for bactericidal effect but upon the mercury content instead. From this viewpoint it differs from the dyes proper but is mentioned here because it is considered by many primarily as a dye, and its action is said to be due to the dye substance wholly or in part, whereas the fact is that the dye factor is simply one of making the mercury less irritating and making it possible to employ it in large doses without seriously affecting the body tissues.

Einhorn (1) has reported two successful cases in which with one half of one per cent. calcium carbonate solution, the employment of the intestinal tube and one per cent. mercurochrome solutions were employed. The gratifying results obtained are rather confused because one half of one per cent. calcium carbonate solutions, as well as the mercurochrome, are distinctly bactericidal and regular transintestinal lavages alone will benefit many cases whatever the solution employed. There is probably also some benefit in the use of the intestinal tube because the tip could deliver the solution into the ileum and from it quickly into the colon—the usual site of the ulcerative area.

Mercurochrome solution was employed in three cases of syphilitic colitis with ulceration with benefit, and in a number of bacterial types also with benefit. We have found that in the intestine this substance is far from nonirritating. We do not know why, but intolerance to its use and even the quick precipitation of a marked acute colitis was far too common for its employment. We have carried the percentage of the solution down from five to one and yet had severe results. In the last year we have used it by enemata and still had unhappy results. It is probable that the small amount of the solution which Einhorn employed (two ounces of a one per cent. solution) would be tolerated, but relying on this substance alone in large enough quantities to influence the bacteriology it too often is followed by a discharge of almost pure blood, marked abdominal distress, fever, and intense irritability of the colon that lasts from one to two weeks from one injection. We feel that this is due largely to reaction of the intestine to the mercury content and we have practically discontinued its use and are now employing the straight dyes, which, by the way, may prove irritating enough to give one unhappy moments.

Animal experiments and their use in humans in many ways show that neutral acriflavine and gentian violet are certainly most innocuous. In solutions of moderate strength even the sensitive conjunctiva will not become irritated by them. Yet every now and then their employment in the intestine will light up abdominal distress, with acute distention of the abdomen from gas, griping pains, and other conditions. At first we believed this to be due to some chemical effect of the dyes on the tissues, but further observation and study of cases in large enough classified groups suggest that this is not the case. It is more probably due to an effect of the dye on certain restraining organisms present in the gut at the time of the instillation of the solution. The organisms of the Bacillus coli group are largely protective. If in a given case, in which acriflavine is employed, they are acting as such against an inimical bacteriology that would not be influenced by acriflavine, infecting anaerobes are suddenly given full sway with the production of alarming although not fatal clinical symptoms. Conversely, if the infecting organisms are of the gram negative type, the use of gentian violet may bring about lesser degrees of distress by restraining the gram positive anaerobes, but these are far easier of tolerance and control. When possible, it is therefore important to determine which organisms are present before either of these dyes is employed. But when this is not possible, the results obtained by the use of one of these dyes, with the symptoms that follow, will often give one the important information required as to which dye to employ in a routine way.

ACRIFLAVINE (NEUTRAL).

Browning, of Glasgow, proved that this substance in serum has bactericidal power twenty times as great as bichloride of mercury and eight hundred times as powerful as phenol or dichloramine-T. In the presence of serum, acriflavine was the most potent bactericide for both staphylococcus and Bacillus coli and equally so for the enterococcus and the anaerobe Bacillus œdematis maligni. These are potent organisms for mischief in some of the cases. So far as the intestine is concerned, in a general way it answers best for those infecting organisms that belong to the gram negative class. Among these may be mentioned: Bacillus dysentericus, Shiga, Kruse, Bacillus coli (semiparasitic types), Bacillus pyocyaneus, Bacillus alkaligenes, Bacillus paracoli, Bacillus paratyphosus, Bacillus typhosus, Bacillus enteritidis, and Bacillus œdematis maligni (gram positive).

This dye may be employed with comparative safety in the intestine in strengths of from one in one thousand to one in five thousand solutions and in quantities up to one litre. It may be employed by duodenal tube, preferably in normal saline solutions, to approximate the serum as nearly as possible, or by enemata. Used in 0.1 gm. enteric coated tablets taken frequently during the day it is of benefit at the conclusion of active treatment.

GENTIAN VIOLET.

To Churchman (2) credit is due for attention being drawn to the bactericidal effects of this dye. In the main our investigations agree with what he has presented. It has been shown, with some modifications that are not of cardinal importance, that gram positive organisms are destroyed by the dye while those of the gram negative group are comparatively undisturbed. Some resisting and hardy spore bearing gram positive bacteria are astonishingly sensitive—and may represent an important inimical content in an individual case. Unfortunately, the growth of the most common offender, the Bacillus welchii, may be hindered but never stopped. This is also the case with the Bacillus sporogenes, an organism of some importance in this connection. Observation shows that the designation of gram positive or gram negative indicates a fundamental characteristic of bacteria but that there are some exceptions in different affinities to gentian violet in different strains of the same bacteria. On the whole, however, the behavior of the bacteria with this dye is constant and clear cut enough to be regarded as a biological characteristic of constancy. The gram positive organisms in the intestinal tract that are inhibited by gentian violet and which may be factors in infectious colitis are the following: Streptococci, staphylococci, Bacillus anthracis, Bacillus putrificus, and Bacillus welchii.

Gentian violet is safe to employ in strengths of from one in one thousand to one in eight thousand solutions and any quantities. It is used by duodenal tube in any type of solutions and best in hypertonic ones. By enemata or in enteric coated pill, 0.5 gm., it can be used frequently without harm.

The observations on the effects of dyes are not clinical but those of laboratory procedure. Considering the variability of the same strains of bacteria in a biological sense and also the differences existing them all, especially the groupings one sees in intestinal canals, we not only have difficulty in determining whether they are causative factors, their importance in diagnosis and their reaction to dyes, but we have the great problem of a rapid change in the chemistry of the dyes when thrown into the long intestinal canal, where any bactericidal power they may have is quickly vitiated. By immediate contact all dyes produce prompt and fairly deep staining of visible mucous membranes. This occurs in the gastrointestinal tract when introduced into the rectum and it takes about fourteen hours for the color to disappear. If the dye comes in contact with a length of mucosa, various body fluids, fecal substances, etc., while still in solution, it undergoes a rapid oxidation or reduction, thus its indirect employment by duodenal tube instead of directly by the anus makes a difference in mucosal staining and sometimes in the clinical results. If the intestinal canal were a closed cavity like an empyema sac or an infected joint better staining of tissue and bactericidal effect of the dye would be obtained.

In testing the dyes we have employed a bland diet in the severe cases for a short time, but ample and full meals in most cases all the way through. The dietetic restrictions were characterized by no interest and a forcing of food in the majority of the cases. Bismuth, opium, or other drugs were not employed and the adjuvant of rest was not utilized. No abdominal applications were permitted, and no irrigating solutions of any kind other than the dye solutions were employed. In a word, the bacterial diagnosis being made, we depended entirely upon the bactericidal effects of the dyes in changing the biology in the gut. Altogether thirty-seven cases of infective and ulcerative colitis were treated and studied during acriflavine or gentian violet solutions until now we feel that sufficient information has been gained to permit of more rounded procedures and a wider routine in the clinical handling of them. These may be expressed in the following conclusions:

CONCLUSIONS.

In all chronic diarrheal conditions, syphilis, tuberculosis, and the parasitic conditions must be carefully excluded from the bacterial cases.

It is in the latter cases that the most intractable infections and ulcerative states are encountered and these cases should have the advantage of a bacterial diagnosis when this is possible.

The gram differential staining method is valuable to a considerable extent in judging the type of biology present and suggesting the dye selection. In doubtful cases subculturizations and study of individual bacteria may be called for.

Most of the pyogenic organisms are gram positive and gentian violet is indicated, and on the other hand the bacteria of the typhoid dysentery coli group are gram negative and best influenced by neutral acriflavine. Mercurochrome 220 is potent in all because of its mercury content, but it is very irritating. It is especially indicated in the syphilitic cases.

These cases represent all grades of intractability to treatment. Some are so simple that diet and medication answer, in others lavage of the intestine with a saline, hypertonic, chlorine or similar solution answer the purpose. In the more severe cases, gentian violet and neutral acriflavine solutions are potent for good in influencing an abnormal bacteriology and are well worth a trial.

In but one of the thirty-seven cases in which dyes were used was a fistulous opening in the right colon required. In eleven patients who had fistulous openings when they came under observation, the openings were closed before treatments were begun with the dye solutions.

The dye to be used in a given case having been selected, the best procedure is to irrigate the intestine with a hypertonic solution containing sodium or magnesium sulphate and phenolphthalein, using up to 1,000 c. c. When the bowels are flushed and active purgation is taking place, though the duodenal tube is still *in situ*, the dye solution is run in. The hypertonic salt solution cleans out the canal and has it in active peristalsis when the dye solution is instilled, and in this way it is not changed so much in rushing through the intestine and has immediate contact with the mucosa which is infected. With the acriflavine this method is essential, whereas with gentian violet the dye may be added to the hypertonic solution.

The dyes may be used by the patient at home by enemata and in pill or tablet form. This enhances the result.

Dieting may be of some value but with the dye therapy it is not important. Rest is a valuable adjuvant, and symptoms of distress may have to be controlled by medication.

By this method of treatment, even in seriously septic cases with fever, surgical operations seem to be no longer necessary and only in exceptional cases need to be used.

After clearing out the infection and repairing the ulceration, these colons remain friable, and for such occasional doses of bismuth, building up the body, and the use of agaragar by mouth are of value. Finally, as was proved in a sufficient number of nonulcerative conditions, the two dyes, neutral acriflavine and gentian violet, have potent powers in influencing intestinal bacteria.

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1. EINHORN, M.: *Am. Jour. Med. Sc.*, April, 1921; *Medical Record*, October 15, 1921.
2. CHURCHMAN, J. W.: *Jour. Exper. Med.*, vol. xv, 1912; vol. xvi, No. 6, 1912; vol. xviii, No. 5, 1913.

21 WEST SEVENTY-FOURTH STREET.

Drugs in the Treatment of Diabetes Mellitus.—P. J. Cammidge, J. A. Cairns, Forsyth, and H. A. Howard (*Lancet*, December 23, 1922) state that it is unlikely that treatment by drugs will ever replace control of the diet in diabetes and that lack of care in working out an appropriate diet can be compensated by the administration of drugs. They attempt to show that if the food tolerance has been accurately determined and is found to be inadequate, then, and only then, may the aid of appropriate drugs be invoked to enable a maintenance diet to be taken and prolong the patient's existence under more comfortable conditions; also to record their experiments, indicating the way in which various drugs control carbohydrate metabolism, thus laying the foundations of a rational therapy. In diabetes, accurate diagnosis is the only sure basis of treatment, and they believe that the pancreatic, hepatic, and other types they have described should be differentiated by analyses of the blood, urine and feces before serious treatment is commenced.

Quinidine in Auricular Disease, Paroxysmal and Established.—John Parkinson and J. W. McK. Nicholl (*Lancet*, December 16, 1922) state that quinidine is indicated in paroxysmal auricular fibrillation because it either inhibits the attacks or reduces their incidence in some cases, which no other drug, not even digitalis, will do. It has little or no effect in paroxysmal tachycardia. It is likely to prove valuable in auricular flutter because it sometimes restores normal rhythm immediately, and if not, it may succeed after digitalis alone has converted the flutter to fibrillation but not to normal rhythm. In a small proportion of cases with established auricular fibrillation, quinidine restores normal rhythm, which continues indefinitely with great clinical benefit. In most cases quinidine is unsuccessful in that normal rhythm is not restored, or when restored is not maintained, or restoration is unattended by clinical improvement. After explaining its limitations to the patient, a trial of quinidine should be made in chosen cases of auricular fibrillation where there is no history of embolism, no great enlargement and no serious failure.

Abstracts from Current Literature

PEDIATRICS.

Summer Diarrhea in Infancy.—Wilfred J. Pearson (*Practitioner*, July, 1922) says that in treatment we are faced first with the problem of managing the acute stage. The main indications are to eliminate toxins by stopping all food; to evacuate the stomach and bowels; to combat collapse by restorative measures; to replace fluid loss, and to neutralize toxins by giving alkalies. In the later stage the chief concern will be to find a suitable diet.

Evacuation of the stomach and bowel may be effected by washing out the stomach with sodium bicarbonate solution, one dram to a pint of water, and irrigating the colon with warm water or saline, by giving a dram or two of castor oil, or small doses of calomel every hour for six doses followed by milk of magnesia. In severe cases, when diarrhea is profuse, purgation must be avoided. If a child is much collapsed a mustard bath, a tablespoonful of mustard to a gallon of water at a temperature of 100° to 105° F., is a valuable stimulant. If it reddens the skin a good prognostic sign is furnished. Then the child should be put to bed in a warm, well ventilated room. If further stimulation is needed five to ten minims of brandy well diluted may be given every hour or two. If necessary, subcutaneous injections of strychnine, or of camphor in olive oil (gr. ¼ in five minims), may be given. To replace excessive fluid loss subcutaneous injections of normal saline are indicated, three to six ounces at a time, at intervals of five or six hours, at a temperature of 105° F. In very urgent cases saline may be given intravenously.

In the breast fed a temporary withdrawal from the breast is advisable in most cases, water being given for twelve to twenty-four hours. When feeding is started again, skimmed maternal milk should be given; later, when a return is made to breast feeding, only short feedings should be allowed at first, the time being gradually extended until full feedings are taken. Plenty of water must be given throughout, especially when the child is being underfed. In the artificially fed all food must be stopped for from twelve to twenty-four or forty-eight hours, until the acute symptoms subside, boiled water, weak tea, or rice water only being given. This is essential. The return to food is difficult and no definite rules can be laid down, but each case must be treated on its merits. Whatever kind of food is chosen attention must be given to the following points: to give small amounts at first; to make additions slowly; to note the effect of such increases on the temperature, the stools, and the general condition. Generally speaking, it is best to avoid milk until the temperature is nearly normal. In all cases fat should be left out at first. This leaves the option of a diet mainly protein or mainly carbohydrate. If, in a case in which the stools are strongly acid, starvation causes a decided improvement and a fall in temperature, a protein diet is indicated. Boiled skimmed milk may be added cautiously to rice water, giving at first one quarter to one half an ounce every second feeding and gradually increasing if improvement is maintained. The next step, the stools now being formed, is to add sugar cautiously in small amounts to equal parts of skimmed milk and water. Buttermilk is often successful as an alternative, or a half cream dried milk, or ordinary milk and water. Whey is often well tolerated, but in many cases is not satisfactory. In other cases the persistence of the temperature and the continued frequency of the stools suggest an infective process, and then it is often better to give foods containing a little residue. If skimmed or peptonized milk does not agree, greater success is often obtained with a malted food or a malted milk.

In a child over six months old who presents definite signs of colitis, the best treatment is to give arrowroot water, one to two tablespoonfuls to the pint, or Benger's food at first and to add skimmed milk or buttermilk without fat later and by degrees.

Drugs play a relatively small part in the treatment. After the intial stages, when the diarrhea persists, small doses of castor oil may be valuable. Large doses of bismuth may be of much value when the large bowel is affected. Opium is useful when the stools are very frequent or there is severe pain; it is of the greatest service in the choleraic type. Generally speaking, it should not be prescribed early, until the bowel is emptied, if cerebral symptoms are definite, or if motions are small and offensive.

Constipation in Infancy and Childhood.—Eric Pritchard (*Practitioner*, July, 1922) says that as a factor both in the causation and treatment of constipation diet is undoubtedly important, but not so important as regularity of habit and suitable training, and that when babies are trained to have only two actions a day "at call," the motions are usually butterlike and formed. The management of constipation differs in breast fed infants, in bottle fed infants, and in older children.

When constipation is due to some fault in the food of a breast fed infant, it is difficult to make a correct diagnosis. The fault may be one of quantity or of quality. If of quantity, this may be proved by estimating the total amount of milk consumed in the twenty-four hours by the application of the "test feed." If of quality, the error may sometimes be detected by an analysis, but not as a rule. After such errors in quantity and quality as can be detected have been corrected, the educational régime may be reinforced by a small daily dose of the following mixture:

Tinctura aloes	♏iij
Tinctura belladonnæ Tinctura nucis vomicæ } aa	♏j
Syrupus sennæ	ʒss
Syrupus ficorum, ad	ʒj

The dose to be gradually reduced till not needed.

In bottle fed infants modifications in the food are indicated. It is necessary to consider whether the condition is due to deprivation of such accessory elements as organic salts, vitamines, lecithin bodies, or extractives, which would predispose to rickets and atony of the bowel. The routine treatment by increasing the cream, or adding olive or cod liver oil, is unsound, as is also the giving of certain proprietary foods, which consist mainly of carbohydrates. A regular practice of giving three or four ounces of vegetable or bone broth is advised. For the older children reliance must be placed chiefly on the observance of the cardinal rules of physiological feeding. It is generally due to defective training in infancy and to the abuse of drugs. Purges, enemata, and suppositories are harmful. Physical exercises, designed to bring the abdominal muscles into play, are helpful.

Tuberculous Bacillemia in Infancy.—Henri Catherine Chisholm (*Lancet,* September 2, 1922) March 14, 1923) report that the only point of interest from an intensive study is that bacillemia is a little less frequent in the nursing than in the adult. Under six months of age the prognosis in tuberculosis is extremely grave, but after the sixth month the prognosis improves and approaches that of adult life.

Malnutrition, or the Infantile Dystrophies.—Catherine Chisholm (*Lancet*), September 2, 1922) asserts that in the treatment of malnutrition, a careful history and study of the child are essential. The debilitated atrophic type of child requires stimulation of the appetite and metabolism by massage, electricity, baths, stimulants, nursing and general hygienic measures; the body should be kept warm, the food should be well balanced and increased as rapidly as possible and the signs of intoxication, acidosis, febrile temperature and infectious diseases must be guarded against. In intestinal disturbances, sickness, or vomiting, the diet should be light and increased cautiously; the offending element of the diet should be sought and eliminated. The tolerance for fat is regained with difficulty, but sugar tolerance is regained fairly easily by utilizing the various forms of sugar and starch; protein is well tolerated, especially if the curd is lightly and easily passed through the stomach. The diet should be built up slowly and with great care until one that is properly balanced has been obtained.

Treatment of Infantile Paralysis in Children.—G. R. Girdlestone (*British Medical Journal,* September 30, 1922) proposes the following plan of treatment for infantile paralysis: In the first stage, the child is completely and comfortably wrapped in cotton wool or gamgee tissue and placed on a Thomas double spinal frame with a headpiece, on a soft saddle, with the feet at right angles on footpieces and the pelvis true. If the arms are affected they are held abducted, with the elbows flexed. This immobilization is maintained for at least six weeks, or longer if necessary. After all tenderness has disappeared, light massage without movement is begun. In the second stage, the requisities are: 1, posturization of the trunk and limbs; 2, correction of any deformities that may have developed, and 3, the resumption of function by, a, stimulation of the skin by light massage, b, reeducation and comencement of active movements, and c, locomotion without overstrain. In the third stage, the patient's capabilities are developed, either by stabilization of the joint, transplantation of tendons, etc., or suitable appliances; operations, such as arthrodesis, are postponed until after the age of eight or ten and patients with flail knees are kept walking in calipers until after the school life is completed.

Infantile Eczema.—Howard Spohn (*Canadian Medical Association Journal,* July, 1922) considers this disease to be due to a congenital metabolic defect, and fat intolerance to be the most frequent cause. In all severe cases protein skin tests should be made. The child should be put on evaporated milk or boiled skim milk, starch should be substituted for sugar, and all raw fruit or fruit juice should be eliminated from its diet. Usually they can be given enough fat soluble vitamine in codliver oil to protect against rickets. After the severe symptoms have subsided some patients can be given orange juice. Local treatment consists of using olive oil in place of water for cleansing, and the application of tar and resorcin ointments. No benefit can be obtained from this without the very active cooperation of the nurse or mother. The child must be kept from scratching, the arms being put in restrainers and the hands in mitts, the legs kept apart, if affected, so they cannot be rubbed together. After the scales and crusts have been removed with oil a thirty to fifty per cent. tar ointment with one per cent. salicylic acid may be used, but sometimes this is too irritating and more applications are advisable. For the scalp a four per cent. resorcin ointment is usually effectual. After the severe symptoms are over any bland oily substance will suffice.

Sleeplessness in Infants.—Charles E Sundell (*Practitioner,* July, 1922) says that it is well to bear in mind that the cause for a baby's wakefulness is most often a simple one, and simple causes should be sought for first. Attention to the temperature of the cot and of the room, screening of lights, and the avoidance of clatter or loud conversation, are so obvious as to require nothing more than mention. Most common of all are the discomforts of the gastrointestinal system—flatulence, colic, hunger and, what is so apt to be overlooked, thirst; many a child cries in the night for fluid, and is given instead the makings of a lump of casein curd. It is always worth while giving a wakeful child a drink of water; it is seldom refused, and often satisfies.

Two other causes of wakefulness must be borne in mind—irregular habits and excitement while awake. The temptation to postpone the time for a baby's sleep, so that he may be admired by some relative or friend who is late in arriving, or so that his nurse may finish some work on which she may be engaged, must be strongly resisted. A sleepy child who is kept awake exhausts his nervous energy very quickly in peevish restlessness, and when preparations are at last made for his sleep he may be too weary to settle down. Physiological proof of this indisposition for slumber is to be found in the increased reflex irritability of a sleepy child, an irritability which is soon soothed into sluggishness should sleep be not too long delayed, but which persists and increases if the balm of sleep is withheld.

Regularity of habits is one of the sheet anchors by which the barque of an infant's health is secured. The reestablishment of a regular routine, after even a short break, frequently calls for patient perseverance on the part of the nurse, but though the child may protest vigorously for several nights, absolute firmness seldom fails to procure the desired result.

Compulsory Exclusive Feeding With Butter Flour Soup During the First Two Weeks of Life.—Johannes Schoedel (*Monatsschrift für Kinderheilkunde,* July, 1922) reports good results with the feeding of a butter flour mixture in fifteen infants who had to be fed with this mixture after two to thirteen days' feeding with breast milk. The feeding was begun with small amounts and was gradually increased until a total of 150 grams to the kilogram of body weight was given at the middle or end of the second week; this amount was administered as long as the weight continued to increase. When the increase in weight ceased, the amount of the feeding was gradually increased to 160, 170, or at the most 180 grams to the kilogram of weight. The mixture was prepared in the manner originally advised by Czerny and Kleinschmidt. Another guiding principle was to give one-third butter flour mixture if the weight was below 3000 grams and two fifths butter flour mixture with a weight above 3000 grams.

Colon Bacillus Agglutinins in Infants with Disturbed Nutrition.—E. Aschenheim and D. Holstein (*Monatsschrift für Kinderheilkunde,* July, 1922) report that in three cases out of twelve, they found an unusually marked agglutination in the blood serum of infants with disturbed nutrition, which led them to believe that the agglutination was the result of the disease process. One case showed a typical intoxication, with sugar and albumin in the urine, convulsions, toxic respiration, profuse diarrheas and the vomiting of hematin. Another case showed an acute milk albumin dyspepsia in a child affected with syphilis. The most marked agglutination occurred in the third case, an infant eight months old, with dyspepsia and colon bacillus cystitis. These findings gave support to the theory that a specific reaction was present in these three cases. In both of the cases of socalled dysentery, the agglutination was negative toward the excitants of the dysentery but was positive toward the colon bacillus.

The Ascent of Colon Bacilli in the Nutritional Disturbances of Infants.—Eugen Kramár (*Monatsschrift für Kinderheilkunde,* July, 1922) reports on the clinical and bacteriological investigations in parenteral infections and chronic fermentative dyspepsias. In the former there is a parallelism between the occurrence of the dyspepsia and the invasion of the duodenum by the colon bacilli. There are also dyspeptic disturbances, in which the invasion of the duodenum by colon bacilli is absent and, on the other hand, there may occasionally be colon bacilli in the duodenum without any diarrhea and therefore the dyspepsia is not attributable to the ascent of the colon bacilli. No increase in the agglutination titre, worthy of mention, toward the strains of colon bacilli was demonstrable during the course of the parenteral dyspepsias. On the other hand, some of the cases of chronic fermentative dyspepsia regularly and consistently showed invasion of the duodenum by colon bacilli and a fairly high agglutination titre was demonstrable in the patients' blood serum toward their own strains of colon bacilli, particularly toward the strains cultivated from the duodenum or the stomach. The bacteria appear in the stomach only occasionally in acute exacerbations.

The Blood Platelets in Infancy.—Klaus Keilmann (*Monatsschrift für Kinderheilkunde,* July, 1922) states that with the Spitz method the thrombocyte values vary between 48,000 and 192,000 to the c. mm. of blood. Values below the minimum of 40,000 and those above 200,000 to the c. mm. should be considered as pathological. The number of thrombocytes is not influenced by the time of the day nor the taking of food. In premature infants, no diminution in the number of thrombocytes was demonstrable. In dystrophic children, the maximum values do not seem to be as high as in normal children, but the minimal values seem to correspond with those found in normal infants. In one case of infantile sepsis, an extremely low number of platelets (24,000) was found, associated with a positive Rumpel-Leede sign; with the subsidence of the acute symptoms the number of blood platelets was increased to normal.

The Effect of Position in the Family on the Health of the Child.—R. H. Vercoe (*Lancet,* October 7, 1922) found that in intelligence, height, weight and pigmentation there is no appreciable difference between any of the children in a family; whereas, in the incidence of disease, the worst child is definitely the eldest, while the best is definitely the eighth child and upwards. The author, therefore, draws the following conclusions: 1, that the quality of the average child does not deteriorate in any way with successive pregnancies; 2, that the quality of the family does not deteriorate in any way with increase of quantity, inasmuch as the eighth children, who are drawn entirely from large families, are inferior to none and superior to the eldest, who are drawn largely from small families.

Instillation Treatment of Enuresis in Childhood.—William R. Barron (*Southern Medicine and Surgery,* June, 1922) describes his method of treating enuresis in children by installations. In girls he uses a small glass female catheter with a rubber tube attached. With aseptic precautions the catheter is introduced into the bladder and through it is instilled one ounce of a three per cent. argyrol solution. This is allowed to remain in the bladder for from thirty minutes to one hour, when it is voided. This is done daily or every other day, and the strength of the solution is increased until in some cases a ten per cent. solution can be borne. In boy patients the argyrol solution was injected into the urethra with a bulb syringe, forcing it into the bladder. Barron has treated about thirty-five cases, mostly of boys, at least seventy-five per cent. of whom have remained cured, some of them having had as few as three treatments.

The Influence of the Hydrogen Ion Concentration and Buffer Value of Foods on Digestion, With Special Reference to Infancy.—Harold K. Faber and Fannie Hadden (*Medical Clinics of North America,* September, 1922) conclude: 1. Optimum conditions for the action of the digestive enzymes demand that certain grades of acidity be established in the stomach and of alkalinity in the intestine; the ease of digestion of any food depends upon the ease with which it permits the requisite reactions to be established in the gastrointestinal tract. 2. The reaction and buffer properties of colostrum indicate that it is intended for intestinal digestion. The development of gastric digestion is gradual and probably not completed for a considerable period of time under normal conditions. 3. The reaction and buffer properties of protein milk and lactic acid milk suggest that their curative effect may be due to stimulation of the gastric function to take up a greater share of digestion. 4. Most of the carbohydrate infant foods have little or no buffer value and hence do not materially affect the digestibility of milk, but the foods containing potassium carbonate are somewhat alkaline and interfere to some extent with gastric digestion.

Child Welfare.—Robert Bell (*Medical Times*, London, June, 1922) looks upon a superabundance of starchy food, such as white bread, corn flour, arrowroot, and decorticated rice, as pernicious to child welfare. On the other hand, whole wheat bread, oatmeal, and barleymeal are highly nutritious. Fresh milk in its unaltered condition and uncooked fruits are of great dietetic value. Vegetables should be cooked without water in a double boiler to conserve their natural salts. Dried fruits, such as dates, figs, and sultana raisins, are highly nutritious and much favored by children. A number of children, mostly boys, with tuberculous glands and bone tuberculosis, regained their health under a diet which excluded starchy foods, such as white bread and potatoes, and which consisted of whole wheat bread, oatmeal porridge, milk, cheese, eggs, fruits, and salads. To this regimen was added four or five grains of calcium chloride three times daily after meals.

RESPIRATORY DISEASES.

Seasonal Variations of the Weight of Tuberculosis Patients. — N. J. Strandgaard (*Acta Medica Scandinavica*, November 29, 1922) estimates that the average weekly gain in weight at the Danish tuberculosis sanatoriums calculated for a period of ten to twenty years is between 200 and 250 grams for each patient. The gain in weight varies considerably from week to week, it may be two to three times higher or lower than the average, consequently also negative, the latter occurring five to six times a year, sometimes simultaneously at several sanatoriums. The weekly variations show on the whole a distinct parallelism in the patients at different sanatoriums, and this uniformity seems chiefly to be due to changes in the humidity of the air, partly also in the atmospheric temperature. Moreover, there are striking monthly variations in the gain in weight. This gain in weight is much the same winter and spring, rises gradually during the summer and reaches its maximum in September, declining steadily in October and November. Similar monthly variations are, however, to be found in other countries, so that weight maximum in Norway occurs in August, in the remaining part of Europe in September, in Pennsylvania in October, in India in November, and in the Argentine in May. Consequently maximum seems to change in proportion to the degree of latitude of the place, and the monthly variations seem to depend on the orbit of the sun.

Other monthly variations imply that particularly great gain in weight occurs in the months with low atmospheric pressure, medium temperature, medium amount of sunshine and large rain fall, while particularly small gain in weight is found in the months with high atmospheric pressure, slight rain fall and particularly low or particularly high atmospheric temperature, besides a particularly small or particularly large amount of sunshine. A continuation of researches would probably give valuable facts to judge of the significance of the influence of climatic and meteorological conditions on the gain in weight and thereby also on the cure of pulmonary tuberculosis.

Scientific Justification for the Classification of Pulmonary Tuberculosis Into the Open and Closed Forms.—Alfons Winkler (*Wiener klinische Wochenschrift*, August 24, 1922) draws the following conclusions: The classification of pulmonary tuberculosis according to the excretion of bacilli is of practical importance and based scientifically upon such anatomical and clinical foundations that it ought to be developed further and placed on a uniform basis. Such a classification should be made, not as it was heretofore, almost exclusively from bacteriological points of view, but it should be considered chiefly from the clinical points of view. The terms open and closed should be retained until the nomenclature is more uniformly determined. The term infectious instead of open should include not only the lasting obligate, but also the intermittent facultative excretion of bacilli. The term infectious tuberculosis should include all forms, in which there is an open communication between a tuberculous focus and the bronchial tree and in which sputum containing tubercle bacilli is expectorated; this would also include the cases in which the excretion of bacilli has not as yet occurred or has ceased because of a pronounced lung finding or characteristic general condition, but can always begin or cease.

Serodiagnosis of Tuberculosis.—On the basis of his investigations, which included forty-five sera of tuberculous patients and those suspected of being tuberculous and forty-eight control sera, N. Takenomata (*Schweizerische medizinische Wochenschrift*, February 1, 1923) asserts that the complement fixation test is a reaction, which can aid in the establishment of a definite diagnosis in a number of cases. This reaction is usually positive in tuberculosis of the lungs, in tuberculous pleurisy, and also, as it appears, in other tuberculous affections. In the early stage, in a beginning apical infection, as well as in a more advanced stage of tuberculosis, failures occasionally occur, but on the other hand early cases may also react positively. Of the forty-eight control tests, three sera showed a positive reaction, although tuberculosis could be excluded by the clinical finding and, therefore, the possibility of false positive reactions must be borne in mind. There was no occasion to test the value of serodiagnosis systematically in surgical tuberculosis. Only bacillus emulsion preparations should be used as antigen in the complement fixation reaction; the author had good results with the Besredka antigen and also with the bacillus emulsion prepared by himself. The other serologic methods were not reliable or applicable in the form used by the author: the precipitation test was negative and the agglutination test frequently failed in his experiments.

Histological Findings in Chronic Tonsillitis.—Otto Mayer (*Wiener klinische Wochenschrift,* February 8, 1923) endeavors to show that in the tonsils of patients in whom the clinical symptoms and findings of chronic tonsillitis exist, there were also demonstrable pathological histological changes, which must be termed chronic inflammatory. It appears very noteworthy to the author that these inflammatory changes may affect not the entire tonsil, but only circumscribed portions, so that one may speak of chronic inflammatory focal lesions, which were sometimes demonstrable only in serial sections of the tonsils. The author also showed that the tonsillar plugs do not always show trivial and insignificant findings. The author recognizes that the tonsillar plugs may call forth an undeniable defensive reaction on the part of the mucosa of the crypts, in which they lie. The tonsillar plugs consist not only of desquamated epithelium and detritus but they nearly always also contain fungi and numerous other bacteria. The fungi belong to the streptothrix group; the pathogenic actinomyces does not seem to be found here. At the present time it is impossible to say whether these fungi are themselves pathogenic and produce the chronic tonsillitis, or whether they merely prepare the soil for the suppurative bacteria.

Tonsillectomy in Infancy and Childhood.—Earl M. Tarr (*Archives of Pediatrics,* January, 1923) asserts that infection is the prime indication for tonsillectomy. Preoperative study of the cases and caution are vital. A knowledge of the anatomy of the throat is necessary. Correct surgical technic is imperative. Tonsillectomy in children under twelve years of age should be done under general anesthesia. The hospital is the safest place in which to anesthetize the patient and to operate. The choice of instruments is a personal matter. Ninety per cent. of the author's work is done with a modification of the Sluder instrument. To those who do not believe in tonsillectomy for infected tonsils, the author suggests röntgen irradiation as a beneficial treatment, given, of course, by a qualified röntgen therapeutist.

The Tonsils in the Tuberculous.—Maurice Fishberg (*Medical Clinics of North America,* November, 1922) found that pulmonary tuberculosis occurs most often in persons in whom the atrophy of the lymphoid tissue in Waldeyer's tonsillar ring is extreme. When appearing in patients in whom the tonsils are large, in whom the adenoid vegetations in the rhinopharynx are prominent and the lymphoid follicles on the back of the tongue are large, the tuberculous process in the lungs seems to run a mild course and tends to recovery in the vast majority of cases. These patients do well as long as the tonsils and adenoids are not removed surgically. In contrast to these cases, there are those with active and progressive tuberculosis of the lungs, with pale throats, small tonsils, with a lingual tonsil visible only rarely and with the sinus tonsillaris appearing as if evacuated. In fact, laryngeal tuberculosis is rarely associated with large tonsils; the reverse is the rule. The condition of the lymphoid tissue in the throat is, within certain limits, a good prognostic sign. In the vast majority of cases of active tuberculosis, the prognosis is unfavorable when the tonsils are small, the mucous membrane of the rhinopharynx pale and the lymphoid follicles absent; the prognosis is good, on the other hand, in tuberculosis patients with large tonsils, adenoid vegetations and a congested mucous membrane. Tuberculous patients who contract coryza, tonsillitis and rhinopharyngitis, especially of the epidemic type, have a better outlook than those who escape these maladies when exposed to infections.

Asthma, Hay Fever, Nasal Hydrorrhea, and Angioneurotic Edema.—In a partial review of the etiology, Charles B. Williams (*Laryngoscope,* January, 1923) declares that the vasomotor disturbances mentioned in the title are only symptoms of anaphylactic origin, that protein sensitization is responsible for the precipitation of attacks in a large percentage of cases, if not, in fact, the cause in many; that dysfunction of the ductless glands possibly plays an important role; that exposure to cold leads sometimes to a hemoclastic shock, which in turn may precipitate an attack of spasmodic coryza or others of these vasomotor disturbances, and that foci of infection, particularly about the head, should always be searched for when seeking to find the cause for these disturbances.

Essentials in Diagnosis and Treatment of Pulmonary Tuberculosis.—J. H. Stygall (*Journal of the Indiana State Medical Association,* March, 1923) emphasizes certain points. These are: 1. Numerous sputum examinations should be made in all suspicious cases. 2. Pulmonary hemorrhage and pleurisy with effusion are always due to tuberculosis until proved otherwise. 3. Definite, persistent râles or x ray mottling above the second rib or third dorsal spine are always due to tuberculosis except in rare instances. 4. Definite râles at the base with no signs at the tops are not due to tuberculosis unless there is a positive sputum. 5. Absolute rest is the only specific we have for active tuberculosis. 6. Tuberculin should never be given to patients with fever.

Resistance of Tubercle Bacilli to Boiling.—Karl Preis (*Wiener klinische Wochenschrift,* October 26, 1922) has shown that all the acid alcohol fast bacteria known up to the present time are completely decolorized by boiling water within one minute, whereas the tubercle bacillus retains its stain sufficiently even after five minutes. Bovine and avian tubercle bacilli and those from cold blooded animals show a considerably less resistance to boiling than the human type of tubercle bacillus. Specimens (slides) must not be fixed nor excessively heated during the staining process; decolorization should always be done with fresh water and only in metallic vessels. The boiling procedure should be applied only for a closer differentiation between genuine tubercle bacilli and pseudotubercle bacilli.

Treatment of Pneumonia in General Practice.—Warren T. Vaughan (*Southern Medicine and Surgery,* April, 1923) summarizes his routine treatment as follows: adequate rest, both physical and mental, with sedatives when indicated; light diet with forced fluids; daily enemas; sputum typing as early as possible, and administration of immune serum when indicated; use of digitalis, alkalies and oxygen, stressing the use of oxygen early, rather than when the patient is moribund; abundant fresh air for lobar pneumonia, warm fresh air for bronchopneumonia; careful observations for complications both above and below the diaphragm.

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SURGERY.

Temporary Plating of Fractures of the Long Bones.—G. H. Edington (*British Medical Journal,* December 23, 1922) asserts that, 1, operative treatment should not be a routine, but properly reserved for cases where nonoperative measures fail to secure restitution of fragments; 2, that temporary plating of the tibia, femur and humerus is a reliable form of internal splinting; 3, that the skin incision should be placed so as not to be in immediate contact with the fracture; 4, that the periosteum should be reflected from the area to which the plate is to be applied so as to encourage the formation of callus; 5, that flat, four hole plates, bent if necessary to fit, and fixed with Lane's screws, give satisfactory results; 6, that external splint support is necessary; 7, that plates and screws are to be removed in from three to four weeks; 8, that looseness or fixity of screws at the time of the removal is in proportion to the reaction or sluggishness of the bone and would seem to be an index to the progress of repair, and 9, that plating does not prevent delayed or nonunion.

Surgical Treatment of Nontraumatic Affections of the Spleen.—James Carslaw (*British Medical Journal,* December 23, 1922) says that the mere finding of splenomegaly is no excuse for operation. Operation is contraindicated in such diseases as malaria and syphilis, although trauma in such diseases may necessitate operation. He is also opposed to operation in leucemia and in Hodgkin's disease. He is not convinced of the necessity of operation in pernicious anemia; certainly not if the spleen is small. Some types of pernicious anemia are more suitable for operation than others. The spleen should be extirpated as soon as possible in splenic anemia, if the patient's health and development are chronically poor, if attacks of splenic pain occur repeatedly, and particularly if the danger of hemorrhage seems to have supervened. For if the disease is allowed to advance too far (cirrhosis of the liver and ascites), the operation is not only more difficult but the chances of ultimate success are diminished. Splenectomy is most successful in cases of acholuric jaundice; mild cases may not, however, require operation. But if hemolysis is extreme and the patient's condition deteriorating, the operation should be recommended, and splenectomy has produced complete and permanent cure.

Surgical Treatment of Tuberculosis of the Lungs.—Hanns Alexander (*Schweizerische medizinische Wochenschrift,* January 18, 1923) warns against the artificial pneumothorax treatment, even in the light cases, because complications occur all too frequently and the duration of the treatment is not diminished. In severe cases interference is justifiable even with a moderately severe involvement of the other side, provided one proceeds very slowly and carefully, that a considerable increase of pressure is never produced, that strict rest in bed is enforced and that the better side is carefully watched. It is always advisable to remove part of the phrenic nerve before doing a thoracoplasty because the resulting spontaneous contraction considerably aids in the result from the thoracoplasty.

Routine Treatment of Fractures by Operative Methods.—As a result of his experience, Archibald Young (*British Medical Journal,* December 23, 1922) arrives at the following conclusions: 1. Silver wire is not very satisfactory for wiring bone fragments; brass wire was found very satisfactory for the fixation of fractures of the jaw, olecranon, patella, clavicle, tibia and the phalanges. 2. For pinning or nailing, the less bulky the pin or nail, the better the result, except for fractures of the epiphysis or neck of the femur and the upper end of the humerus; in fractures of the lower epiphysis of the humerus, small, fine nails are used; "sprigs" or fine wire nails are the best, especially in fracture separations, fractures of the bones of the forearm, fractures of the phalanges and of the metacarpals. 3. Plates and screws have given very satisfactory results in fractures of the clavicle, forearm bones, humerus, femur and tibia. 4. In fractures of the shaft of the femur and other long bones, screws alone are sometimes applicable. 5. Pinning and plating combined give good results in severe fractures of the lower end of the humerus, T shaped, into the elbow joint. 6. The results with ring plates were unsatisfactory.

Chronic Duodenal Ileus.—D. P. D. Wilkie (*British Medical Journal,* December 23, 1922) finds that efficient mobilization of the third and the lower end of the second parts of the duodenum is the secret of easy anastomosis. Although not covered by peritoneum, the duodenum unites without difficulty and he uses only the finest catgut for the anastomosis. The use of a special angled clamp simplifies the operation, but is not essential. In combination with a posterior gastroenterostomy in cases of stenosing duodenal ulcer along the duodenal ileus, the duodenojejunal anastomosis should be planted on the jejunum about six inches beyond the gastroenterostomy. Where an operation on the biliary tract is necessary the duodenojejunostomy should be done first to avoid the possibility of contaminating the sibcolic area.

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Dentistry and Medicine*

By LEWELLYS F. BARKER, M.D.,
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Adequately to understand the interrelationship between physicians and dentists we must first have a correct idea regarding the relationship existing between the subjects that these two groups of professional men represent, namely, medicine and dentistry. Medicine, as a science and an art, has as its special province the recognition and treatment of disease. It acquires a knowledge of the laws and principles that hold and it finds out how to apply these principles for the good of patients by inventing useful methods and by seeing to it that its representatives acquire skill and experience in the employment of these inventions in practice. Dentistry has a precisely similar function as regards the teeth and gums; it is to these structures in the mouth what medicine in general is to the whole organism with all its parts. Obviously, then, dentistry is only one of the special divisions of medicine, and the relation of the dentist to the general practitioner of medicine should be much the same as that of any other specialist in a circumscribed domain. In other words, the dentist is comparable to the ophthalmologist, the laryngologist or the otologist, who studies, respectively, diseases of the eye, diseases of the nose and throat, or diseases of the ear.

The layman's idea of the dental specialist is, as a matter of fact, very much like his idea of any medical or surgical specialist. I asked a friend of mine the other day what she thought of dentists as a whole. "Well," she said, "they seem to be people into whose hands you have to put yourself and let them do what they like to you, and half the time you don't know what they're up to." Well, the layman has a similar idea of the medical specialist, say the rhinologist or the gynecologist. "A dentist," my friend went on to say, "looks in your mouth and says, 'How long since you had that work done?' You tell him and he remarks, 'Humph; well, they used to do in that way.'" That reminds one of the nose and throat specialist who looks in your mouth, sees an infected stump of tonsil and remarks, "Yes, they used to take them out that way." Dental specialists sometimes disagree as do other medical specialists. The same friend to whom I have referred has a winter dentist and a summer dentist who have diametrically opposite views on certain dental matters. She tells me that she goes to the one in the summer and to the other in the winter, and that "between the two, things work out very well." This is an attitude toward dentists that also has its counterpart perhaps in the behavior of the layman towards other medical specialists.

If the view that dentistry should be a medical surgical specialty is correct, why is it that the dentist is more sharply marked off from the rest of the medical profession than is the ophthalmologist, the laryngologist or the otologist? To answer this question one must consult the history of the origins of dentistry and of medicine and must consider also the way that medical and dental education respectively have developed. Only so can we reach an understanding of the relative isolation of dentistry from general medicine and from the other medical specialties.

Dentistry as a specialty had a long history before it tended to become separated from medicine. It is recorded that as far back as five hundred years before the Christian era, some medical men devoted themselves especially to dentistry. Dentistry and medicine were, as a matter of fact, closely associated until long after the period of the revival of learning. It was only after surgery and the other medical and surgical specialists had begun to develop more conspicuously that dentistry began to follow an independent path.

This relative independence of the course of dentistry can, I think, be easily explained. In the first place, as operative and prosthetic dentistry gradually developed, the technical complexity of the mechanical manipulations found to be necessary came to require so much attention and devotion on the part of those practising them that no time or energy of the practitioners remained for other kinds of medical work. In the second place, men who worked intensively in general medicine or surgery, or in surgical or

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*Paper contributed to the survey of the interrelationship between physicians and dentists, at a stated meeting of the New York Academy of Medicine, February 2, 1922.

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medical specialties, could not master their own subjects and also find time to acquire the technic of dentistry and to make themselves skillful in applying it. Hence physicians and surgeons for the most part neglected dentistry. As a result two groups of dental practitioners began to appear. A smaller group consisted of men who, though trained in general medicine and surgery, finally specialized in dentistry, ultimately restricting their medical and surgical work largely to the dental field; such dental practitioners were true medical specialists, just as are the ophthalmologists, the otologists and the laryngologists of today. The other larger group of dental practitioners of the time of which I speak were not trained in medicine at all; they were mere artisans without theoretical knowledge and without any thorough mechanical training; they practised dentistry crudely, by rule of thumb, in much the same way as the primitive optometrists fitted spectacles, without knowledge of the anatomy, physiology or pathology of the organs upon which they operated. This was the state of affairs that existed some two hundred years ago, when Fauchard, the "father of modern dentistry," published his important treatise entitled *Le chirurgien dentiste ou traité des dents*. From the time of Fauchard on, the practice of dentistry grew ever more specialized and its practitioners became ever more sharply separated from those of general medicine and surgery. A "profession of dentistry" came to be recognized as something separate from the "profession of medicine," the "dentist" belonging to one profession, the "physician" and the surgeon" to another. This divorce of dentistry from medicine, due, as we have seen, partly to the neglect of dentistry by medicine, partly to the rapid technical development of dentistry itself, though in some respects harmful, proved, in reality, to be advantageous, at least in some ways, for the further development of dentistry on its mechanical side. Men to whom dentistry appealed devoted themselves exclusively and wholeheartedly to the development of dental technic and rapidly improved the dental art.

The evolution of dental education has been similar to, and in many respects as interesting as, that of medical education in general. Up to 1840, it was the custom for dental practitioners of ability to pass on their knowledge and skill and their secrets by means of the apprenticeship system. As the methods of modern science, however, came to be applied to the study of the dental tissues, researches on their anatomy, physiology and pathology soon led to the accumulation of a body of knowledge that made it necessary and desirable that dentistry should be systematically, rather than desultorily, taught. The dentist of the newer time needed, in addition to mechanical and manipulative skill, a thorough acquaintance with the anatomy, physiology and pathology of the mouth, and at least some knowledge of the structure, functions and diseases of the rest of the body. The better representatives of dentistry recognized that the apprenticeship system of dental education would no longer suffice; if a narrow artisanry were to be avoided, provision had to be made for a thorough professional education either in medical schools with special departments of dentistry or schools organized especially for instrucion and research in dentistry.

Here in the United States the establishment of dental associations for the advance of dental science "by free communication and interchange of sentiment," and the publication of dental periodicals, helped to force the movement toward the establishment of dental colleges for the systematic education of dentists. The first dental society of the world was, I believe, organized in the city of New York in 1837. Three years later a national association of dentists was formed. In 1839 the *American Journal of Dental Science* appeared, as the first of dental periodicals. And, in 1840, in my own city, the Baltimore College of Dental Surgery had its start, the first of the institutions for the systematic teaching of the science and art of dentistry.

Since 1840 dental associations, dental publications and dental schools have rapidly multiplied, not only in this country but all over the world, and the science and art of dentistry have progressed as rapidly as, if not more rapidly than, many of the other special divisions of medicine. The quality of men entering the dental profession has steadily improved; original researches upon dental problems have attracted many clever minds; and the application of physics, chemistry and mechanics to practical dentistry has resulted in achievements that have astounded the world.

During the past few decades we have been witnessing a revival of the closer relationship between mdicine and dentistry. That relationship ought not to remain clandestine or irregular. It has now reached an intimacy that justifies remarriage. The better dentistry of today demands qualities of mind and heart, a thoroughness of general and special education, a knowledge of facts and principles, and a training in practical technical methods, that are in no way inferior to the requirements in any other medical specialty. Moreover, workers in every branch of medicine must today know how to make use of diagnostic facts in dental domains and should be aware of the possibilities of therapy that dentists control. Furthermore, the dentist who desires to give to his clientele the best results of our present day medical science must have some knowledge of the relation of anomalies and diseases of the teeth to pathological processes elsewhere in the body; he should know, on the one hand, how these processes can affect the teeth and the gums, and, on the other, how diseases of the teeth and the gums may affect the other organs. Practitioners of medicine should know when to ask for a dental consultation and practitioners of dentistry should know when to ask for a medical consultation, and whether a general practitioner, an expert röntgenologist, or some other medical or surgical specialist, can be most helpful to him. Medicine, as regards the various specialties, is advantageously polygamous, and the time has come when dentistry, like other specialties, should again share medicine's "bed and board." For medicine needs dentistry as one of its favorite helpmates. It desires the aid and comfort, not only of the consulting dental diagnostician, but also the advantages derivable from the activities of the dental therapeutic subspecialists, namely, the pyorrhea specialist, the orthodontia specialist, the extracting specialist and the specialist in prosthetic dentistry.

As a working internist, I have been greatly helped by the consultant dental diagnostician, especially when searching for foci of infection that could account for metastatic infections elsewhere in the body (antritis, arthritis, myositis, osteomyelitis, endocarditis, nephritis, neuritis, or iritis), or when seeking the source of an intoxication that might account for a grave anemia, a gastric catarrh, an obscure neuralgia or a general rundown state.

Dental caries, with its sequelæ, is responsible for many human ills, and physicians owe much to dentists for the education of the public regarding its prevention and regarding the necessity for its early treatment where preventive measures have been neglected. You have shown us that its immediate cause lies in acid fermentation in the mouth, the lactic acid produced dissolving out the calcium phosphate and allowing peptonizing and putrefactive bacteria to destroy the decalcified tissue exposed. We believe from our experience that the teeth of certain persons are especially predisposed to caries through faulty inheritance, through the existence of certain physiological states, like pregnancy, and through the occurrence of such diseases as diabetes and anemia.

Physicians, as well as dentists, are also interested in the anomalies of dental development, especially in the hypoplasias of the enamel that are met with in rickets and in tetany, with their peculiar distribution on certain of the teeth; in the delayed eruption of the teeth met with in children suffering from hypothyroidism; in the concave defects of the cutting surface of the permanent incisor teeth in congenital lues; in the erosive caries that attacks the necks of the deciduous teeth in children of feeble constitution; in the occurrence of huge medial and small lateral incisors in status thymicolymphaticus; in the spacing of the medial incisors and, sometimes, of the other teeth in persons in whom the pituitary gland is overactive; as well as in the changes in the gums that are met with in scurvy, in mercurial poisoning, and in lead poisoning. These are only a few of the conditions in the teeth and gums in which the internist and the dentist have a common interest.

If dentists and medical men are to be reciprocally helpful, there must be a greater frankness between them and a greater willingness for cooperation than has hitherto existed. Disagreements regarding facts and principles must be fully discussed in order that right methods of practice may be reached. In this connection I should like to give definite expression to my own ideas regarding the recognition and treatment of oral sepsis. Though I deprecate as much as anyone the unnecessary extracting of teeth, I feel that a grave responsibility is assumed by anyone who advises the retention of diseased teeth when they are a menace to the health of the patient. And in the decision as to whether a tooth dare be retained, the dentist should not be the sole arbiter; nor should the röntgenologist or the physician be the sole arbiter; the opinion of the dentist, the expert röntgenologist and the physician should all carry weight; the responsibility for diagnosis and treatment in dental domains should, today, be shared. There are still too many dentists who seem to be unaware of the diseases and fatalities for which their inadequate treatment of infected teeth and gums have been responsible, still too many who defend modes of dental practice that those better capable of judging unhesitatingly condemn. There are still too many physicians who ignore the dangers of oral sepsis, or who show too much compliance with the foolish whims of patients who beg to retain the infected teeth that injure them. Our better dentists and our better physicians and röntgenologists should arouse public opinion to a degree that will result in the protection of patients from the ignorant and the incompetent.

Let us welcome, then, an ever greater cooperation between the dental specialist, the general practitioner, the röntgenologist, and the other medical and surgical specialists. Whatever will contribute to the advance of dentistry will help medicine as a whole, and medicine in turn must do everything possible to supply facts from the larger domain that may be useful to the dentist in his special branch.

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The Relationship Between the Physician and the Dentist*

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It is really a noteworthy event when two great societies like the Academy of Medicine and the First District Dental Society of New York join hands in the consideration of so important a subject as the one under discussion this evening, and on behalf of the dental profession outside of New York, I wish to offer my heartiest congratulations to both bodies on this evidence of an altruistic spirit, which I feel certain is destined to result in great benefit to the people who are conjointly served by the physician and the dentist.

Every thinking man in either calling will admit that in the past—particularly the recent past—much harm has resulted to patients through failure of good teamwork between physician and dentist, and it may be profitable to consider briefly some of the circumstances which have led up to the present situation. For many years the dental profession had tried to impress upon medical men the importance of the teeth as factors in health and disease, and it is no disparagement of the medical profession to state that little attention was paid to the matter on their part. They were naturally more concerned with weightier problems—problems which involved the life or death of their patients, such as tuberculosis, appendicitis, carcinoma, and other diseases. But a curious thing happened, which changed the trend of their thoughts, and focused their attention on the teeth. One of their own members, Sir William Hunter of England, came out with a strong statement to the effect that many of the ills from which humanity suffered were traceable directly to oral infection, and cited case after case where clearing up the mouth conditions had resulted in amelioration of the systemic symptoms. And the most curious thing of all is that while Hunter is today credited with being the man who took the initiative in directing the attention of the medical profession to the teeth, the fact remains that the infection to which Hunter alluded is not at all the infection which today seems such an alarming thing to a large number of medical men.

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*Read before the joint meeting of the Academy of Medicine and the First District Dental Society of the State of New York, February 2, 1922.

What is concerning physicians most at the present time is the possibility of serious trouble from focal infections located out of sight at the apices of the roots of pulpless teeth, while Hunter never alluded in the most remote manner to this source of infection in any of his published reports. What he emphasized was the infection around artificial crowns and bridges inserted by dentists, "gold traps of sepsis," as he termed them, and spoke of the benefits to his patients from swabbing the mouth with antiseptic washes. And in this connection it may not be improper to correct a misconception started by Hunter—possibly in the most innocent way in the world. He was very strong in his invective against what he termed American dentistry as bringing about all of these disastrous results, when as a matter of fact, Hunter was not at all familiar with American dentistry as practised in the better offices in this country. What he saw was the hideous parody on dentistry as produced by men who posed as American dentists in London, but who no more represented the better practitioners of either America or England than the veriest quack represents the splendid practitioners of medicine. This was a misconception to which the conscientious practitioners of dentistry in America never should have been subjected, and yet it came about in such a natural way, and probably with the utter absence of ulterior motive on Hunter's part, that dentists here accepted it with the best grace possible, and with the hope that good would ultimately come from it.

But what concerns us most at this time is the relationship between physicians and dentists in the management of those cases where certain systemic disorders are supposed to be caused by the teeth. As soon as the attention of the medical profession was called to the fact that the teeth were a possible factor in infection they naturally began giving these organs a great deal of consideration. This was perfectly proper because the function of the physician is to cure disease, and yet in the present instance we feel that two errors crept into the situation. One was the fact that in many instances an altogether exaggerated idea of the relationship of the teeth to general disease gained ground, till they were charged with being the cause of every known disorder from premature baldness to ingrowing toenails. This concentration on one idea to the exclusion of a wider vision is not confined to the medical profession. Dentists are fully as prone to it—probably more so—and it is even said to permeate the legal and all other learned professions. Balance seems to be the most difficult thing for men to acquire, and it is without question true that in the present instance many physicians and dentists were thrown completely off their balance. The shameful sacrifice of many serviceable and harmless teeth that has been witnessed in the recent past is not creditable to either medical men or dentists, and it is confidently believed that conferences between the men of both callings, such as the present, will usher in the dawning of a better day.

The second error relates to the fact that physicians did not always take the best means at their command to get at the truth. Their usual procedure was as follows: A person became ill and sought a physician. If the complaint was one which could in any way be traced to infection—and today in the minds of the profession most diseases can be so traced—the teeth were at once suspected because they happened to be in the limelight. Accordingly, the patient was immediately sent to a radiographer for pictures of the teeth, and it was just at this stage that much mischief was inaugurated. The x ray man may have been a physician who in the natural order of things is not intimately informed on the teeth and their supporting structures; he may have been a dentist who is not intimately informed on anything; or he may have been neither physician nor dentist, but merely a man who can make pictures, and who has not given a moment's study to the anatomy of the parts he is portraying. And yet what happens?

Sagely, this x ray man will write a diagnosis on his chart and send it back to the physician. The latter, acknowledging in all sincerity that he cannot interpret radiographs, accepts the findings of the radiographer and straightway sends the patient to an exodontist to have the suspected teeth removed. Following this summary routine many a hapless victim has been bereft of useful teeth, which were altogether harmless, or might have been made so by treatment. And yet in some aspects this routine is a perfectly natural one. The physician wants to see his patient get well, and if what he has heard about the teeth is true, they are very terrible organs. But what he has heard is not all true, and some of his misinformation has come from dentists themselves. For instance, when he is told that a pulpless tooth is a dead tooth, he is seriously misinformed. It was the dentist who first gave this misleading term to the medical profession, and as a dentist I wish to offer an apology to my medical colleagues for this grave error. Doubtless the introduction of the term dead teeth has done much to cloud the issue in the minds of medical men. No conscientious physician wants anything dead in his patient's mouth, and the sooner medical men learn that a pulpless tooth is not a dead tooth, the better it will be for all concerned. The destruction of the pulp removes sensation and sustenance from the dentin, but so long as a living pericemental membrane surrounds the root and attaches the cementum to the alveolar process the tooth cannot properly be called a dead tooth. Medical men should note this fact because of its intimate bearing on the matter under discussion.

We have stated that the routine just referred to is a natural one, because of the physician's desire to get his patient cured, but it has one very serious defect. It leaves out of consideration something that might prove of great advantage in aiding to clear up the situation, namely, consultation with the family dentist. He has records of the case and frequently can throw much light on conditions which otherwise would be obscure. And yet, in too many instances he has been entirely ignored, and the patient has been summarily ordered to have the suspected teeth extracted. What would be thought of the general practitioner of medicine who would refer a patient to a surgeon for the removal of an eye instead of sending the patient to an oculist? Or order the removal of a turbinate without consulting a rhinologist? And yet these men have not been specializing in their work as long as has the dentist in his. Since 1840, when the first dental college was organized, dentists have been studying hard to acquire authentic information regarding the teeth and adjacent structures, and in all modesty we feel that their opinion is entitled to as much respect at least as that of the general practitioner of medicine, whose training along these lines has at the best been very meagre. And yet it is not putting the case too strongly to state that in recent years many practitioners of medicine have been ignoring the dental specialist, and assuming an attitude which is not at all justifiable!

Instances are not rare where patients have been advised by their physician to leave their regular dentist and go to some one who would do the bidding of the medical man when a difference of opinion arose as to the advisability of extracting certain teeth. This might seem a permissible procedure in the protection of the patient provided definite knowledge was accessible today as to the direct relationship between the teeth and remote disturbances, and also provided the physician could interpret radiographs of the teeth more accurately than the dentist. But the last word has not yet been said on the subject of focal infection as it relates to the teeth, and it has yet to be demonstrated that the physician knows more about the teeth than does the dentist. When the time comes—as come it must—that it is possible to differentiate between infections caused by the teeth and those caused by other tissues or organs, there will be greater justification for passing judgment on the teeth as offenders, but until that time comes there should develop a more conservative attitude toward tooth extraction than there has been in the recent past.

It is not with dentists a question of prestige. We are not so much clamoring for our prerogative—legitimate as it might be for us to do that—as we are fighting for the welfare of the patient. And in the past few years patients have suffered untold injustice through faulty points of view on the part of medical men as influenced by an undue concentration on the teeth as the chief factors in causing systemic infection, and on the radiograph as an infallible means of disclosing conditions at the root ends of teeth. The teeth are by no means the sole agency for spreading infection, and the radiograph is by no means infallible in its disclosures. These two facts should sink into the consciousness of every medical man, because they are fundamentally and demonstrably true. Countless hundreds of good serviceable teeth have been sacrificed on the altar of this idea without the slightest resultant benefit to the patient, and many other cases have been reported of recovery from systemic trouble where teeth have been retained, in the face of x ray evidence pointing to the necessity for their removal. Case histories could be recited by the score to support this statement, if space permitted.

Dentists would be the last men to argue that the teeth should be ignored in physical examinations, or to contend that they were not an important factor in health and disease. During the entire history of the profession they have labored to emphasize the significance of the teeth as agencies for good or ill. But their present contention is that in the recent past an undue emphasis has been placed upon the teeth as causative factors in disease, and that the x ray as a diagnostic aid has been magnified out of all proportion to its legitimate possibilities. The x ray does not demonstrate infection, it does not show abscesses, nor does it tell whether or not there are pus pockets at the root ends of teeth. The only thing the x ray does in this connection is to reveal varying degrees of density in the alveolar process around the roots of teeth, and this is of sufficient importance to entitle it to our respect and admiration, without distorting the evidence as has too frequently been done. When a radiolucent area is discovered in a picture at the end of a root, there is no man of sufficient vision to tell whether it means an abscess or whether it is merely a thinning of the bone, which may have occurred years previously when the tooth first lost its pulp, and in which today there is no infection whatever. A diagnosis should never be made on x ray evidence alone—the clinical history of the case being of just as great significance, and sometimes throwing more light on it than the picture itself. We frequently hear the statement made that a photograph will not lie, but as a matter of fact, there is nothing in all human experience that may be made to so misrepresent a fact as a photograph.

In the face of this uncertainty as to what the x ray reveals, the psychology of the situation has been seized upon by too many of our radiographers to unnecessarily frighten people. They write upon their diagnostic charts such terms as abscess, infection, evidence of disease, pus pocket, etc., and when the physician receives this he hands it to the patient. This would be bad enough even if the x ray infallibly demonstrated these things—which it does not.

Think of the psychology of this. Every practising physician knows full well the mental effect on many patients of being informed that they have abscesses or infection sealed up in their jaws. If they never have felt ill before, they begin to feel ill now. And when this is done on any such unreliable evidence as x ray pictures it amounts almost to a crime. It is as bad as some of our socalled health articles in the daily press. The less we tell the laity of the symptoms of disease, the better it is for them. All instruction along legitimate lines on the conservation of health is most commendable and should be published broadcast, but when these articles begin to elaborate on symptoms, they place themselves perilously near the level of the patent medicine advertisement.

This matter of the psychological effect on patients from reading the diagnostic charts of their teeth inscribed by radiographers has assumed so serious an aspect that the practice of writing these terrible terms should be frowned on by all reputable practitioners of either medicine or dentistry. Information of what has supposedly been found may be conveyed to the practitioner without unduly alarming a susceptible patient.

This entire question of the relationship between the physician and dentist is one easy of solution, provided the equity of the situation is recognized by both. We as dentists cheerfully accord to the medical profession a wider range of vision than we possess. Medical men are concerned with the entire physical and mental economy of the patient, while dentists are confined in their ministrations to a limited area of the physical mechanism. Our only contention is that within the limits of this area, our opinions are entitled to as great respect as are those of the medical man—and we might go even further and say, in a proper spirit of modesty, that in matters of detail they are entitled to greater respect. We pledge ourselves to an attitude of the most cordial and helpful cooperation at all times in the effort to clear up obscure conditions, and to aid the physician in ameliorating the ills from which our common humanity suffer. All we ask is that, in the interest of the patient, our help is sought when it is needed.

22 East Washington Street.

Dental Diagnosis*

Its Importance in General Medicine

By W. GILMAN THOMPSON, M.D.,
New York.

Two great discoveries of modern medicine, namely, the causative relationship of focal to general infection and the application of the x ray in diagnosis, have done more than anything else to bring into closer harmony the professions of medicine and dentistry. So long as the possibility of systemic infection from an alveolar abscess remained unsuspected, it made comparatively little difference to the patient whether he went first to his dentist or his doctor, and never having been instructed in regard to this possibility he often failed to mention to one of them that he had visited the other. It is this lack of coordination between the findings of the two professions which heretofore so frequently has proved unfortunate for the patient.

More accurate and detailed knowledge is desirable as to those debilitating systemic diseases, which, either by lowering vitality and resistance to infections, or through altering local secretions in the mouth, tend to accelerate disease processes in connection with the teeth which often, when neglected through the patient's weakness, carelessness, or dread of the dentist's chair, make rapid and extensive progress.

Much might be done to remedy this state of affairs if the physician would give more careful attention to the general appearance of the teeth and gums and in referring the patient to the dentist send with him an abstract of the symptoms. This would doubtless add greatly to the interest of the dentist in the case and stimulate the thoroughness of his work.

On the other hand, in those instances in which the patient applies first to the dentist and conditions are found which are likely to impair digestion, give rise to the swallowing or absorption of pus and germs, or otherwise occasion serious symptoms, the dentist should urge the patient to seek his physician for the purpose of thorough physical examination, and should send with him a detailed statement of the conditions observed and local treatment recommended. All this seems a simple and rational procedure, and yet how seldom it is followed as thoroughly as it should be.

Another matter, the importance of which is so little appreciated, is the great desirability of promoting more frequent general conferences and discussions between dentists and physicians. How rarely are dentists invited to active participation in medical societies, and the reverse is equally true.

It is easy, as it is perhaps invidious, to criticize the shortcomings of others, and upon looking backward in the matter under discussion, I am impressed by my own neglect of patients who have needed this cooperation, before I came to appreciate the increasing value of it. But I am constrained to say that there is still a surprising number of patients who tell me that their dentists have belittled the importance of radiography and have neglected to emphasize the need of constant hygienic care of the mouth, being, it would seem, interested exclusively in the mechanical perfection of their work. In fact, I might multiply instances in which upon referring the patient back for x ray examination, considerable additional trouble has been disclosed.

The paraphrase "Unhealthy lies the tooth that wears the crown" unfortunately is too often true and the patient who proudly displays a series of beautifully gilded teeth is wholly ignorant that there may be whited sepulchres beneath. Moreover, just as in valvular heart disease, the worst lesions may be absolutely unaccompanied by pain throughout their development, so advanced cases of pulp decay, pericemental abscess, bone caries, necrosis and pyorrhea do not necessarily give rise to any local pain or even discomfort whatsoever.

Those systemic diseases or abnormal conditions in which in the absence of other more definite etiology the teeth and gums may be suspected strongly of exerting at least a participatory influence in causation, may be grouped in general as follows:

1. Digestive disorders arising from imperfect mastication and the swallowing of pus and harmful germs.
2. Malnutrition, particularly in young children.

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*Read before the New York Academy of Medicine, February 2, 1922.

whose first teeth are so likely to be neglected on the ground that they soon will grow a second better set.

3. Neuralgias, neuritis and various forms of tic, all the way from facial spasms and tic douloureux to distal painful neuritis in various parts of the body.

4. Disturbances of the heart action, particularly irregularities of rhythm, more common in the aged, and sometimes mistaken for myocarditis, until treatment of pyorrhea or cleaning up a localized pus focus about the teeth restores the natural cardiac rhythm.

5. Endocarditis, particularly in the young, and the socalled septic endocarditis in older subjects.

6. Anemia, of secondary type, often quite advanced. The causative relationship of periodontal abscess, caries, and similar conditions, to pernicious anemia, while by no means proved, is nevertheless suspicious, for one almost never sees this type of anemia unaccompanied by marked changes of decay among the teeth.

7. Various forms of both acute and chronic arthritis and polyarthritis, and of myositis, formerly classed under the vague title of "rheumatism" and treated by saturation with such remedies as potassium iodide and the salicylates. With these especially, the so-called arthritis deformans should be under suspicion. Whatever view may be held regarding this etiology, it is unusual in my experience to have met with a patient suffering from one of these forms of chronic arthritic disease who could display a fairly normal dental series.

8. Acute septicemia and pyemia, which although fortunately rare in connection with even advanced dental disease, nevertheless include too many cases to admit of longer denial as to etiology. In one such case under personal observation the patient, a man of fifty years acquired a typical septic temperature of many weeks' duration, a trophoneuritis of the leg, pyemic abscess in both legs and a slough of the right arm which extended around nearly two thirds of its circumference and necessitated prolonged subsequent skin grafting. After six months he finally recovered, but when I first saw him his physicians believed him so near death that they feared the shock of even a single tooth extraction. Upon my insistence, however, some half dozen teeth were serially extracted, their abscesses, involving extensive bone absorption, were removed, and the gastritis and extreme anemia with the other symptoms finally yielded to vigorous oral antisepsis. This incident is illustrative of the nearly fatal results which may follow neglect of the tooth brush.

There are other exceptional types of disease in the origin of which the teeth have come under suspicion but the well proved list of maladies definitely originating through diseases of the teeth and contiguous structures is quite long enough to constitute a serious indictment against the lack of appreciation of the importance of mouth hygiene.

It is necessarily admitted that there may be other causes for all the diseases previously mentioned, but when they can be excluded definitely, suspicion reverts to the teeth with greater emphasis. There is at present, in fact, an active rivalry between tonsils and teeth as to their respective ability to interfere with bodily functions remote from those which nature intended them normally to perform, and partisans of one or the other theory are disposed to extend the scriptural injunction, "If thine eye offend thee, pluck it out," to cover the particular structure which for the time interests them. Older members of the medical profession will recall a similar wave of enthusiasm for removing ovaries often in cases in which more mature deliberation and more thorough study would have resulted, if not in the verdict "not guilty" in a verdict of "not proved."

It is furthermore admitted necessarily that all manner of advanced decay of the teeth with extension to contiguous structures exists frequently without any discoverable systemic symptoms whatsoever. Nitroglycerine burns quite slowly and harmlessly in the open air, but how differently it behaves in a confined space, just as pus may react differently on a free surface than in a confined space.

Another phase of this topic which often fails of appreciation by the medical, or rather surgical practitioner, is the fact that during prolonged convalescence after serious operation there is likely to be rapid advance in disease foci in and around the teeth, which may be due both to the lowered vitality of the patient and to his inability, through weakness, properly to observe oral cleanliness. For this reason, whenever time permits, before a contemplated operation of gravity it is most necessary to clean house, so to speak, to the end that convalescence be not prolonged through the flaring up of a periodontal abscess, with toothache and neuralgia, or the indigestion and distaste for food which a poorly conditioned mouth engenders. This matter has for some time been recognized at the Mayo Clinic and other large clinics, but it needs much reiteration for the profession at large. It has been emphasized longer in the prenatal care of the expectant mother, but here also too much emphasis cannot be placed upon its importance.

In illustration I recall a recent case of a patient who, having a protracted convalescence after a complicated prostatectomy, presented so painful a molar abscess that he was obliged to drag himself out to the dentist before he was really fit to move. Yet not one of his half dozen otherwise distinguished physicians and surgeons had suggested to him to have his teeth examined prior to operation, although there had been ample time to do so, and being a physician himself he had given no thought to the matter;

Truman W. Brophy has well written, "The teeth are the least understood and most neglected of all the tissues of the body." This being admitted, their wholesale extraction as the shortest way out of a difficulty is greatly to be deprecated wherever conservative treatment has reasonable chance of success. To this end much more study should be given to the behavior under varying conditions of the many varieties of germs which inhabit the mouth, especially to determine those conditions under which many of these germs take on aspects of virulence after long periods of quiescence. For example, in those two diseases, diabetes and pernicious anemia, in which deterioration of the teeth constantly becomes so rapid, an intensive research into the problems involved might readily yield results of great interest and importance and establish principles of far reaching application. Dentists might well give more practical and individual study to the problems of bacteriology and particularly if encouraged as they should be, by the active cooperation of physicians and pathologists.

Another subject which should be investigated experimentally upon a large scale is the effect of diet, particularly in the young, in determining different types of dental disease. Experiments of this sort which are being made upon animals at one of the prominent hygienic laboratories of the country already give promise of surprisingly important results.

Finally, the undergraduate medical curriculum should include much more systematic instruction in the rudiments of dental pathology, and surgery, emphasizing the now well established relationship between dental and systemic diseases.

17 West Fifty-third Street.

The Interrelationship of the Physician and the Dentist*

By LEROY M. S. MINER, M.D., D.M.D.,
Boston.

Dentistry occupies a curious position in its relation to medicine. Admittedly, the function of the present day dentist is to preserve the health of the tissues of the mouth, and to care for these tissues when they have become diseased. By virtue of this service, dentistry should be as much a genuine part of the art and science of medicine as are the definitely accepted specialties in medicine that restrict their attention to anatomical units, as, for example, otology and ophthalmology.

We see and hear frequently in these days the statement that dentistry is a specialty in medicine. True as this may be in theory, in the conduct of everyday practice, dentistry today is not a specialty in medicine as we commonly understand the term, and is not so considered in the mind of the average physician, nor even, I venture to say, in the mind of the average dentist. Separate professional societies and separate state boards of examiners for licensing to practise definitely differentiate the two. In the same breath that the statement is made that dentistry is a specialty of medicine, we hear that there should be closer cooperation between the two professions, medicine and dentistry. Here again the phrase medicine and dentistry is quite suggestive of the distinction that actually exists. We never hear of medicine and otology, or medicine and ophthalmology, simply because these and other specialties are vital parts of and therefore included in what we know as the practice of medicine. And so dentistry occupies the curious position of being a distinct profession, and yet so closely related to medicine that few would deny that it should be a specialty in that profession. Like the poor relation, dentistry has to be endured by medicine because of the close relationship, but is not altogether welcome as an equal or as a real member of the medical family.

The subject of the relationship of diseased teeth to various systemic diseases, and the opposite of this, namely, the relationship of certain systemic diseases to disturbances in the oral cavity (concerning which we know but little), have awakened the thinking man in both medicine and dentistry to the great need of the correlation of their respective fields of work. Charles Mayo crystallized the matter when he said that the next great advance in medicine must be made by the dentist. It must be evident that to accomplish this, and to solve successfully the many common problems that are facing us, necessitate genuine cooperation between physician and dentist. Only by cooperation can each learn and better appreciate the problems of the other.

And yet in spite of this evident need, I think it is fair to say that the interrelationship that we are discussing does not exist, either educationally or in the conduct of everyday practice, except perhaps in a small way in our larger cities. Certainly the relation of physicians to dentists throughout the country generally leaves much to be desired, and could be greatly improved to the advantage of both.

The truth frankly stated is that the physician generally has a supercilious attitude toward the dentist. This is so definitely apparent that there are men in this city and other large cities practising oral medicine or surgery, and who though trained in both medicine and dentistry, and licensed to practice both, find it to their advantage to make use only of the M. D. after their names. One man here in New York said to me that the use of his dental degree was a distinct handicap, and he had therefore dropped it, and this, in a day when men are so proud to put after their names F. A. C. S. and other letters indicating professional attainment.

What is the cause of this attitude? Of the various factors that might be mentioned probably the most important are, first, the nature of the dentist's service, and second, the educational differences that exist.

As regards the nature of the dentist's work, until recently it always had been considered by people generally a mechanical profession. If a young man indicated a desire to study dentistry, the questions always asked were, Is he mechanical? Can he use his hands? The teaching and training in the dental schools had been directed with the principal object in view of developing operative dexterity in filling teeth, making bridges and plates, and extracting. The reputation for skill that American dentistry possessed indicated how well the dental schools had done their work. From an operative viewpoint, the recent graduate of a good dental school was better fitted to start practice than was the recent graduate in medicine, but because of the fact that dentistry had been so mechanical and therefore not involving life and limb, it had been considered by the physician and by the public, too, of secondary importance.

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*Read before the New York Academy of Medicine and the First District Dental Society of New York, February 2, 1922.

I have used the past tense advisedly in this description for today we are realizing that dental work under some conditions may affect profoundly the life and limb of the patient. Desirable and praiseworthy as mechanical skill may be, the present day dentist who has no broader outlook than this has indeed a limited horizon and has little conception of what the practice of dentistry today really means, nor does he realize the tremendous responsibilities and possibilities that dentistry now faces because of the present conception of the relation of the tissues of the mouth in health and in disease to other structures of the body.

In this connection the educational problem becomes of serious importance. It was natural with only the mechanical aspects to develop, and with no conception of a medical relationship, that schools should have been founded for teaching dentistry, having no connection with medical schools. The result has been that medical and dental education has grown and developed along parallel lines with but few points of contact. The formation of its own state and national organizations has contributed to the further development of dentistry as a distinct profession.

The clean cut separation of medicine and dentistry has been an obstacle in the path of progress. In the light of our present knowledge it is quite clear that the physician knows too little dentistry and the dentist knows too little medicine. Each lacks, therefore, the necessary prospective which might be less noticeable if there was more educational cooperation. Diseases of the mouth and teeth have received practically no attention in our medical school curricula. Some physicians even seem to take pride in their ignorance of dental conditions, as though they were unworthy of their attention.

I cannot help but believe that had physicians as a class known more about dentistry, the problems in connection with dental focal infection would have been handled much more intelligently than they have been. The great need of a chair in stomatology or odontology in our medical schools is so apparent that some medical schools have already established it. The function of such a professor is to correlate dental disease in its various aspects to the systemic conditions that the physician must take care of. This is by no means limited, moreover, to the matter of focal infection.

Dentistry, on the other hand, has suffered from an intensive specialized training. Without a sufficient training in the fundamental sciences, the dentist has lacked the ability to correlate adequately his work with the work of the general medical man or the medical specialist. There are still those who feel that this is not a necessary part of the dentist's function and that our dental schools should continue to devote most of their attention to mechanics and to the development of manipulative dexterity.

Admitting that this is important for the dentist, is it not equally so for the surgeon? The general principle, that the broader the dental training the safer the dentist, particularly in matters of judgment, is a sound one. If more attention was paid to the fundamental sciences allied to medicine in the process of dental education the dentist would be better equipped and could meet the medical man on his own plane. I could risk the development of his manual dexterity. He would acquire it just as does the surgeon.

In point of requirements, dentistry has always been a little behind the medical requirements. Today, with the advanced requirements of one year of college work and four years in the dental school, dentistry is still one year behind the minimum requirements of medicine. Even were they equal, however, dentistry still lacks the medical degree which has been regarded with so much respect down through the ages. I hope to see the day when a doctorate of medicine will be a part of the necessary equipment of the dentist, not alone for the mere possession of it, which permits of the formation of valuable associations, but for the training it represents in branches of science that can be so valuable to the dentist.

The lack of an educational cooperation between medicine and dentistry is quite definite as regards admittance to medical schools. If a man, who has spent four years in a dental school and has received his degree, desires further training and wants to become a candidate for a doctorate in medicine, he finds that no allowance whatever will be given him for his training in dentistry and that four or six years if he has had no college work will be necessary to accomplish his desire. This indicates how far from being a specialty in medicine dentistry really is in the minds of those responsible for standards in medical education. There are, however, many interested in medical education who feel that this inflexible rule could be materially modified to the great benefit of dentistry without injuring medical standards.

In this short paper little more than generalizations can be made. In pointing out some of the weaknesses of the interrelationship of the physician and dentist the educational value to both that would ensue from their correction must be apparent.

I cannot refrain from discussing briefly one concrete problem that is second to none in its importance. I refer to dental caries. So prevalent is this condition that some one has called it the people's disease. It is the starting point of a large part of our dental diseases, and if the cause of this condition could be found, it would obviate the necessity of so much reparative dentistry and solve the problem that some have made so much of, insisting that dental requirements should be kept low in order to have an adequate supply of men to do the repair work made necessary by the ravages of decay. Miller's researches have for many years been accepted. Today, while his theory of decay remains sound up to a certain point, we know the whole truth is not contained therein. The relation of diet to this condition has been studied by some of our best dental research men, and many valuable experiments have been made, but there remains much to be done before the subject is conquered. That dental caries is in a large measure no more than a symptom of some metabolic fault, seems not improbable. Hence, if there is any subject in the world where active cooperation between physician and dentist would be of value from many viewpoints it is this. Active association of the dentist in community health organizations, particularly in the prenatal and pediatric clinics, should in time give us valuable information. But the dentist associated with this work must of necessity have a good training in the fundamentals.

In summing up the subject I cannot do better than quote from a recent report of the committee appointed by the overseers of Harvard University to visit its own dental school. Professor William Sidney Thayer, of John Hopkins University, was chairman of the committee. Some of the significant statements are given herewith.

"Dentistry should be regarded fundamentally as a special branch of surgery. Further and more intimate cooperation between the departments of medicine and dentistry, not only at Harvard University, but elsewhere throughout the country, should ultimately bring this about."

"The ophthalmologist and the physician and surgeon," writes Dr. Thayer, "meet on common ground: they are members of the same medical societies. Their subjects are discussed at common meetings. The dentist and the physician do not meet on the same common ground. This is unfortunate for the physician, for the dentist, and for the patient. The circumstance that the requirements for admission to dental schools have been lower, and the circumstance that the amount of general and medical education demanded of the dentist has been less than that demanded of the physician and surgeon, have worked to place the dentist at a disadvantage in the medical and general community. This has not only been a disadvantage to the dentist, it has been a very real disadvantage to the medical profession. It is, we believe, of importance to medicine that the time may come when the requirements for a dental and a medical education may be the same; when dentistry may become, as it should be eventually, one of the specialties of surgery." Dr. Thayer speaks of the new requirements for entrance to the Harvard Dental School, which now demand not only a high school education, but also a year of college work, as "distinctly a step forward," and he continues, "As the years go by the importance of that branch of surgery practised by the dentist becomes more and more evident, and the interdependence of dentistry and the other branches of the art of medicine and surgery clearer. . . .

"It is believed by many that the position of dentistry in the community is in some ways anomalous. The work of the dentist while in part given to small details in the care of the teeth, extends insensibly into problems of medicine and surgery of considerably greater magnitude. There are many questions relating to the pathology of the mouth and teeth of great importance to the human economy about which there is little fundamental knowledge; such, for instance, as the causes of dental erosion and caries and their possible correlation with other local and general pathological processes in the individual. These are important and attractive problems for investigation. The adequate study of some of these problems calls for men with a wider training than is given to the ordinary dentist, and the questions involved are of considerable importance to medicine as a whole."

The report suggests the acquisition of means for the establishment of further university professorships in dentistry, and for the establishment of special fellowships or research funds providing for the study of pathological problems related to diseases of the mouth and teeth, and the further suggestion is made that students in the dental school might well spend a fifth year of study in acquiring the basis of a general medical and surgical training together with such special training as would justify the additional degree of doctor of dental science.

In conclusion, when the time comes that both physician and dentist throughout the land thoroughly appreciate the need of a close interrelationship and when in the course of that interrelationship they meet on an equal footing, then may we expect to see real progress. Under such conditions the solution of the cause of dental caries may be expected, and this discovery will take its place along with the other great discoveries in medicine.

153 Newbury Street.

Cause and Effect of Malocclusion of the Teeth

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It will be my aim in this résumé to consider well established practical facts as generally recognized and accepted by specialists in orthodontics and to avoid discussion of etiological factors and their sequelæ which are as yet of a more or less problematical nature.

In the study of malocclusion of the teeth, as with all pathological conditions, it will be necessary to review the normal as the basis from which the abnormal may be judged. The term malocclusion does not in itself imply disease but rather an abnormal condition that is a progressive favoring factor. While abnormality and deformity may exist without disease in a general sense, this applies less strictly to the mouth than to other parts of the body, because the rugged stress necessitated by the performance of function makes it essential, if a state of health with maximum efficiency is to be maintained, that the teeth be normal in form and in position. Therefore, a brief general review of normal occlusion will be in order.

In the normal human dentition each tooth occludes with two teeth of the opposite jaw, except the lower central incisors and the upper last molars. The cusps or eminences of the molars and premolars fit into corresponding depressions of certain teeth of the opposite jaw, with machinelike precision and regularity. By this means a series of mortars and pestles is provided for the trituration of foodstuffs. The upper incisors and canines form a slightly larger curve than the lowers, the labial surfaces of which approximate the lingual surfaces of the uppers for about one fifth their length. By this relation they can incise or shear the food. This precise interdigitation is essential also to the longevity of the teeth. By this provision, every time the jaws are closed the teeth come to a definite and positive resting place, a condition essential to the maintenance of health in the supporting structures of the teeth.

Any perversion of this normal relationship is termed a malocclusion whether of the deciduous or of the socalled permanent denture. The deciduous teeth have two principal functions, 1, that of mastication, and 2, that of influencing the development of the bones of the face and cranium.

A malocclusion of these teeth must ultimately be regarded as the result of inharmonious development of the jaws and teeth, or in other words, a perversion of the normal growth of this region, whether of intrinsic or extrinsic origin.

The influence of heredity is much discussed in orthodontics. Some of the foremost specialists ridicule the suggestion that it can enter into the problem. Much has been written about the child inheriting the large teeth of one parent and the small jaws of the other, but the possibility of this is denied by a group of the leaders. They ask that proof be furnished and it must be admitted that it has not been convincingly brought forth. They also point to the fact that as a result of mild, continuous, mechanical stimulation it is possible to grow from a small jaw one of ample size to accommodate, in normal occlusion, the relatively large and malposed teeth. This result is being brought about in daily practice by untold numbers of orthodontic specialists. We, however, believe with the other group that heredity is a factor. Nature always builds toward a type. Supernumerary teeth and missing tooth follicles appear with impressive regularity in families, sometimes skipping a generation and reappearing subsequently. The influence of heredity probably lies in the germ plasm and is inherent in the chromosomes. With this brief allusion to heredity, we shall refer to factors that are better understood.

It will be best to review briefly the development of the mandible and the teeth. The mandible at birth is practically straight. With the eruption of the teeth, the ramus develops and the body of the mandible undergoes growth. This is manifest by a thickening of the bone from the mental foramen to the alveolar border and the ramus begins to approach a right angle with the body of the bone. The mandible performs two functions: a, respiratory, and b, masticatory. Both influence its development. At birth all of the teeth have begun to develop except the permanent second and third molars. The tooth germs lie embedded in the cancellous interior of the jaws. In the upper, they occupy almost all of the area to the floor of the nose and orbit. The maxillary sinus or antrum develops later. Each tooth germ occupies a separate crypt, and as the germ grows the pressure it exerts pushes the crypt deeper into the cancellous bone. Coincident with the growth of the tooth germs is that of the tongue and associated parts, these exerting pressure upon adjacent surfaces of the bone. The attached muscles transmit force to the periosteum and bone, and in the acts of mastication, deglutition and respiration these serve as a mechanical stimulus to bone growth. These forces must act in harmony or the teeth when they erupt may meet outside the influence of the proper inclined planes of their antagonists and cause the beginnings of a malocclusion. Any malocclusion disturbs the balance of distribution of force and results in a disturbance of bone development which, according to Noyes "progresses during the entire period of development."

Usually between the seventh and ninth months the central incisors begin to appear. As the tooth lengthens, the bone from the side of the crypt grows into the wall of the alveolus. As the tooth moves occlusally, the root gradually lengthens. At the same time the tongue and lips exert pressure and influence the direction of bone growth. The jaw thickens and grows forward and outward. The growth of each successive tooth is exerting pressure upon those previously erupted, causing them to move more to the occlusal. This is repeated, until at about two and one half to three years, the twenty deciduous teeth are in place and all normally in proximal contact. The stimulus provided by proper mastication and by the constantly growing follicles of the permanent teeth brings about sufficient growth so that at five to six years of age, spaces have appeared between all of the teeth except the molars. *Spacing of the incisors and canines at this age is just as much normal and to be desired as is the enduring contact in the permanent set.* If this spacing does not occur it indicates improper development of the jaw which must be corrected by orthodontic means or the permanent teeth will erupt either in rotation or out of the line of the arch. All of the crowns of the teeth are as large when they peep through the gum as they will ever be. They do not increase in width afterward, therefore enlargement of the jaw between the anterior deciduous teeth causing them to space is of utmost importance.

If, for any reason, a deciduous tooth must be permanently lost, immediate means should be provided for maintaining the space, otherwise the teeth will shift together. This may lead to impaction of the developing permanent tooth or of its being forced out of line of the arch, and what is more important, if left uncorrected, it will tend to allow the developing permanent first molars to take positions anterior to the normal. Each deciduous tooth has a definite function in the development of normal occlusion of the permanent set. In the order of their importance they are: first, the canines; second, the molars, and last, the incisors, the upper being less necessary than the lowers.

The importance of maintaining in harmony all developmental forces at this tender age becomes apparent when considering the growth of the brain. At birth its average weight is 371 grams, at six years about the time the first of the deciduous teeth begins to be replaced, it averages 1,360 grams. This shows a growth of almost 1,000 grams during the first six years after birth. At nineteen years, the average brain weighs 1,400 grams, or a growth of only forty grams during the thirteen years elapsing between the sixth and nineteenth years. The increase in general body weight during the presence of the deciduous dentition is also striking. From the age at which it becomes complete to the time when all have been replaced, the weight of the average normal child has increased approximately threefold. The permanent first molars appear about the sixth to seventh year to the distal of all the deciduous teeth. The lower usually slightly precede the upper. These four teeth are the first of the permanent teeth to erupt and are of utmost importance, both in maintaining the relations of the jaws and in doing the principal masticating while the deciduous teeth are being replaced by their permanent successors. An abnormal relation of these teeth will entirely change the direction of forces which will be manifested by a modification of bone development. The permanent central incisors are now replacing the deciduous ones. If proper developmental spacing of the anterior deciduous teeth took place, these teeth should erupt in normal position. The lateral incisors will follow in a similar manner at about the seventh to the ninth year, the proximal surfaces meeting normally with the centrals will exert pressure laterally and aid in stimulating the growth of bone needed for jaw development. Proper proximal contact is essential to proper jaw enlargement. Then will follow in similar manner the first premolar at about the ninth to tenth year, the second premolar at ten to twelve years, the canine at eleven to thirteen years, and permanent second molar at about the twelfth to the fourteenth year. If all forces have acted normally, the teeth will have come to their proper positions. One tooth rotated or out of proper alignment can cause lack of proper development of the region a condition that is usually progressively aggravated with the eruption of the succeeding teeth. At thirteen to fifteen years of age there should be twenty-eight permanent teeth in full eruption. Even though these be in normal occlusion, it not infrequently happens that the third molars or wisdom teeth in their growth and eruption at from the sixteenth to the twenty-fourth year, because of lack of jaw area for them, will so crowd that the pressure will unbalance occlusion, sometimes producing a rotation and overlapping of the incisors and canines. This is more marked when the arches are inclined to narrowness and occurs more frequently with the lowers. Unfortunately, we find that less than ten per cent. of persons have normal occlusion without orthodontic assistance.

The too long retention of deciduous teeth is equally as harmful as premature loss. Sometimes their roots are resorbed very slowly and the tooth is too long retained. This is likely to be the case when the pulp has become diseased or has died. Again the tooth may become wedged between erupted permanent teeth. By means of a radiogram it can be determined whether the permanent tooth is developing, and if so the deciduous tooth should be extracted without delay. In fact, we believe it to be the best practice to have very badly decayed and abscessing deciduous teeth removed without delay and means immediately provided for the prevention of the closing of the space, in cases when the permanent successor is not about to erupt. General systemic disturbances are just as possible from diseased deciduous teeth as from permanent ones. In our opinion this fact is too frequently overlooked.

A retained deciduous tooth should not be removed until a radiogram proves the presence or absence of the developing permanent successor. When conditions necessitate the extraction of permanent teeth, means for retaining the space thus made should almost immediately be provided. If this is not done, the teeth adjoining the space will shift and incline toward each other, resulting invariably in an unbalancing of occlusion which becomes progressively more serious with the advance of years. This is a principle which cannot be violated without serious consequences. The one exception is with the extraction of the third or last molars in the arch, and even with these harmful results sometimes follow.

Bone development in the jaws is largely dependent upon proper mastication on the sound physiological principle that "the use of an organ determines its strength." Therefore, the teeth should at all times be in such condition that thorough mastication can take place in entire comfort and the child should then be encouraged to eat coarse and fibrous foods and to make thorough use of the teeth.

Habit is one of the early causes to which attention should be given. Such practices as thumb sucking, lip biting, tongue biting, drawing or sucking the cheeks between the teeth, and others should be corrected, if possible, as soon as observed. The artificial pacifier is potent for much harm. All of these habits tend to mould the jaws into an abnormal form favoring malocclusion. The physician sees these little patients long before the specialist and it is the former who must observe and advise the parent. The orthodontist can by placing a simple appliance often aid materially in breaking the habit. This can often be worn as early as two and one half years. Such habits as persistent resting of the cheek against the hand, as in study, may cause marked asymmetry of the jaw with consequent disturbance of occlusion. Correction of bad habits must be made principally by strengthening the will of the patient.

Adenoid vegetations superinduce mouth breathing and produce a misshaping of the upper jaw. The mouth of a child held habitually open, as in mouth breathing, causes an abnormal muscle pull in the cheeks, thereby bringing pressure in the molar and premolar regions. This tends to cause a narrowing of the jaws and teeth. In the upper the hard palate becomes arched abnormally high. This frequently results in inflection of the nasal septum, the combined malformation producing diminution in the size of the air passages of the nose with consequent impairment of breathing. The correction of this condition often results in most gratifying improvement in the health of the patient. Abnormal tonsillar conditions tend to cause the patient to protrude the mandible in an effort to obtain more throat space for breathing. If uncorrected, the mandible and teeth tend to take on a permanent anterior relationship, producing a prognathous or undershot jaw.

Malocclusion is the most potent factor in the production of diseases of the supporting structures of the teeth. The condition militates against proper mastication. It prevents thorough natural and artificial cleansing of the teeth, thus favoring caries and the abnormal contacts in closure of the teeth result in shock and injury to the peridental membranes, alveolar bone and overlying tissues.

We shall consider briefly the last. This condition has been given by Paul R. Stillman the expressive name "traumatic occlusion." If permitted to persist it may lead to atrophy of the supporting tissues and will lessen their resistance to invasion by pathogenic microorganisms. Periodontoclasia or socalled pyorrhea, or Riggs's disease, must be regarded as only a symptom. The disease proper must be determined and the cause removed if the condition is to be remedied. It is variously estimated by authorities that in seventy to eighty per cent. of cases the cause is primarily a malocclusion and improper restoration of tooth form about the gingival tissues. The subgingival area is the vulnerable point, and it is here that the incipient stage of disease of the soft tissues most commonly takes place. The correction of the malocclusion is a prerequisite to successful treatment of periodontal disease.

Unerupted and impacted teeth, while not strictly within the scope of the title, are practically always associated with malocclusion, except when the offender is a supernumerary. Nervous disturbances are a frequent result and may range from a mild irritability and melancholia through the many manifestations even to violent dementia.

There is more that could be written. The important practical considerations have, however, been included. It will, I feel, be evident that malocclusion can be a potent causative factor in the inception of many bodily disturbances both local and general, ranging in severity from the mildest to the most severe. Malocclusion is an abnormal relationship of the teeth that need not be carried into adult life. The condition can, in all cases, be greatly improved and in the vast majority completely corrected. This can most easily and best be done in the period of greatest natural development of the jaws and teeth which takes place from the eighth to the twelfth year. Many conditions should be treated earlier.

It must be evident that malocclusion may become a menace to health and that teeth in normal occlusion are in that relationship which insures a maximum degree of oral health for the greatest number of years to contribute their part to the bodily health and therefore, to the efficiency and happiness of the person.

Health, Sickness and Death as Related to Dental Infections*

By GILMAN OSGOOD, M.D.,

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I present this paper by reason of my interest in the practical application of the knowledge that infection, developed in and about the teeth, finds a port of entry into the body second to none in importance. Although the tonsils and other avenues are of great moment I shall confine myself to a consideration of the dental infections.

Seven years ago I thought the teeth of comparatively little importance as factors in the etiology of disease, and my present beliefs were gradually developed by observing the effects of teeth extraction on existing disease.

I have sometimes thought the general practitioner is looked upon with suspicion by the specialist, who thinks his lack of knowledge of certain subjects makes him an unsafe interpreter of events, and this may to a certain extent be true, for his work is not ultrascientific—but, on the other hand, his daily observations, which bring into view many things denied the specialist, and include a survey of all branches of medicine, inevitably cause him to make certain deductions from this panorama of events.

An indictment has been found against the tooth and I appear for the prosecution. In courts of law circumstantial evidence is the strongest kind of evidence; it is the inference of fact or facts from existing facts and is more trustworthy in many cases than the spoken words of human beings. I have a few links in the chain of evidence, which, taken separately, may be of little value, but when connected with other links and viewed as a whole are worthy of consideration.

A comprehensive knowledge of any subject is acquired by study of fundamentals, and so if it is true that the origin of many diseases is from infection in and about the teeth, it is selfevident that those who have lived the greater part of their lives without teeth, except the substitutes provided by the dentist's art, should be comparatively free from these diseases.

The incentive for this study came from observing an elderly man in my office last fall. He had had all his teeth extracted when a young man, had always rejoiced in the change to false teeth, and had enjoyed good health. He became a very successful business man, but his activities were not confined to his business and he became expert in antiques and oriental rugs. His agility and keenness of mental vision caused me to observe him with extraordinary interest, and I said to myself—the dentist who extracted your teeth committed a crime, in the eyes of some men of today, but I should like to know how you would appear if the dentist, instead of extracting your teeth, had repaired them with fillings, crowns and bridge work, devitalizing a few during the reconstruction.

I then decided to seek out others who have false teeth and now have records of over one hundred people who have had one or both sets of teeth extracted at different periods of their lives, and have studied the results of such extractions in relation to the general health of these individuals.

Minor details are not included in these histories and when it is a matter of common knowledge that a person has always enjoyed good health, he is eligible for these purposes of study. Some of these people have probably had ailments they did not consider worthy of mention or in their advancing years had forgotten.

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*Read before the Boston Dental Improvement Society, April 11, 1922.

Class I includes thirty-three who had all their teeth out between the ages of fifteen and twenty-five. The present ages of those living, including the ages of four at death, are as follows:

25 to 30— 2
30 to 40— 2
40 to 50— 5
50 to 60— 7
60 to 70—11
70 to 80— 4
80 to 90— 2

The four not living attained the ages of sixty-eight (two), seventy-five, and eighty-nine. The causes of death being senility, septic poisoning, cancer of bowel and heart disease.

Class II includes fifty-three who had all their teeth extracted between the ages of twenty-five and fifty. The present ages of those living, including the ages of seven at time of death, are as follows:

30 to 40— 1
40 to 50— 3
50 to 60— 8
60 to 70—12
70 to 80—13
80 to 90—13
90 to 100—3

The seven not living attained the ages of sixty-five, seventy, seventy-five, eighty (two), eighty-seven, and ninety-three. The causes of death being senility (three), pneumonia, heart disease, fracture of hip and sudden death, one each.

Class III includes twenty-four who had all upper teeth extracted between the ages of ten and forty-five and many of these have no lower molars. The present ages of those living, including the age of one at death, who died at sixty-eight from diabetes, are as follows:

40 to 50— 3
50 to 60— 6
60 to 70— 9
70 to 80— 5
80 to 90— 1

Those in Class I have been remarkably free from sickness of all kinds. We do not find lesions of nervous systems, digestive disturbances, rheumatism or known valvular heart lesions, which were nonexistent at time teeth were extracted.

In those living, excluding minor ailments, sickness incident to childbirth and senile changes, the only illnesses recorded are operations for hemorrhoids, benign tumor of breast, exploratory laparotomy (no pathology), one each; "stoppage," varicose veins, fracture of patella, one each; pneumonia, two, and a few cases of illness where no diagnosis was made.

In the list of dead was one in whom there developed a heart lesion when twenty which was about the time her teeth were extracted. She was left a widow with five children at twenty-five, worked hard, recovered from double pneumonia at sixty-five and died at sixty-eight. In these cases resistance to intercurrent diseases was apparent by their rarity.

In Class II many have enjoyed the same good health as did those in Class I. In only one case did rheumatic fever first occur after all teeth had been extracted, appearing at the age of thirty-six, two years after the last extraction, and was coincident with tonsillitis.

In a few cases we find rheumatic manifestations appearing from time to time, where it had existed previous to extraction and this was also true of hepatic colic.

The earlier in life teeth were extracted, the less likelihood of recurrence of these troubles. The complete disappearance of rheumatism, neuritis, headaches, back troubles, nervous and digestive disturbances was remarkable.

We hear so much about the necessity of preserving the teeth, as they are all important in the process of digestion, and have known so many instances of cessation of these troubles following the extraction of teeth, we ask the question: Is the dependence on teeth for good digestion a matter of knowledge, or is it a matter of opinion?

So rarely have I obtained history of tonsillitis, I infer such is usually secondary to infected teeth.

Class III shows many who have been remarkably free from sickness, but there are several instances where illness has occurred, such as do not appear in Class I, which are accounted for by existing infection in the lower jaw.

The cases I have found of people advanced in years, with perfect teeth, are so few that it would be unfair to draw deductions from them, but in the three years of which I have reports, they enjoyed the same good health as did those in Class I.

The resistance of some people to disease is so great that it will give the critic opportunity to cite cases of aged people who have always had infection in the mouth, but I do not think anyone would wish to argue that the existence of such infection was not without danger, any more than one would maintain that the Spirocheta pallida, which had existed in one's blood for years, without apparent illness, could do no harm.

Just why primary invasion is not always to be followed by infection is a question yet to be answered; but the integrity of the epithelial linings in the various parts of the body are assumed to be the reason why certain persons are immune.

A study of these cases induces me to say, show me a person who for years has harbored no infection in or about his teeth and I will show you a person who has enjoyed good health.

When we see patients seriously ill, examination of the teeth will frequently disclose some evidence of infection in the oral cavity. If the illness has been of short duration, we can expect a rapid recovery by removal of infectious foci.

Those who are neurasthenic or otherwise mentally disturbed; those suffering from lassitude with no pleasure in their work; those with anemia; those with back troubles, whose accompanying scoliosis may have deceived the orthopedist; those with rheumatism, headache, other neuralgias and stomach troubles, are among the beneficiaries of removal of infectious foci; but those that pertain to the nervous system are of special interest.

The work done by Dr. Cotton in the State Hospital at Trenton, N. J., commands our attention, and before his critics pass judgment on his work let them first realize what he has attained. With a recovery rate, during the past six months, of ninety per cent. in the group of functional cases, in which class the rate was formerly thirty-seven per cent., one has to make some explanation of this great change in the number of recoveries. Instead of commenting unfavorably on his methods, let his critics improve on them, for until we can show an equal percentage of cures, it does not become us to be too critical of his work, which I believe is the beginning of a new era in psychiatry.

We have been considering diseases that arise from oral infections, which are not necessarily fatal, although many do play an important part in the cause of death, and include discomforting illnesses and life long misery.

We do not expect to emulate St. Mungo, founder of the Cathedral of Glasgow, who reached the age of 185, or H. Jenkins, of Yorkshire, who died at 169, or Thomas Parr, who lived to be 152, but we do believe that seventy is not an unreasonable age to look forward to and when we see many die at an earlier age, believe many of their diseases to have been preventable. It is said that "dead men tell no tales," but their teeth do. A patient, aged forty-six, consulted me one day, complaining of a bad feeling in the head. His teeth were decayed and I advised their removal, which was not done, and the next time I saw him, three months later, he was laying on the floor of his room, dead, a revolver by his side and a bullet in his body.

A woman, aged fifty-five, who was mentally depressed and had harbored infection in her mouth for a long time, could not be prevailed upon to have teeth extracted, and her children did not wish to employ force in having it done. A year later I saw her hanging by the neck, dead.

A man, aged thirty-six, whose oral infection was thought to be the probable source of his mental depression, was in an institution for observation, from which he was sent home with the advice to go to work, but two days later I viewed his remains as they lay in a pond.

I have been making close examination of teeth in cases of sudden death for a comparatively short time, but have seen six suicides, in which the average age was forty-six, and twelve sudden deaths in which the age averaged fifty-one, in all of which there was evidence of infection in the mouth, and in none had all the teeth been extracted.

Let us for a moment consider what is health, and what does it mean to us. It is a prize above all other things; it is what we desire ourselves and even greater is it desired to have it in our homes. It makes a community, a state and a nation strong.

A great responsibility rests upon us, whose advice helps to determine the health of the nation. Therefore, if people without teeth are more healthy than those who have them, preserved by fillings and crowns, let us advocate more false teeth, for dentistry is a failure if it cannot maintain teeth in the mouth which are not a menace to health.

The extraction of teeth, as quite generally practised, is, however, a two edged sword, for in removing carious teeth we may cause more trouble through systemic infection, which may be worse for the patient than the original trouble. Within the past year I have seen death from pulmonary thrombosis, which occurred two weeks after the extraction of six teeth by novocaine. In consultation I have seen a case of most serious illness, closely following heavy extraction under ether, lasting six months; exact pathology undetermined, but related to the lungs. In the practice of a surgeon friend, a young woman, who had just had heavy extraction under ether, became very ill, abscess of the lung developed. She was operated on and died two weeks later.

I have seen other illnesses existing over periods of weeks and months; some of these illnesses arise from inspiring infection when under ether, while others arise from metastasis.

The necessity of removing many teeth being great, it is important that the operation should be so conducted as to eliminate existing infection, and reduce to a minimum the dangers of systemic infection. Time will not allow detailed accounts of beneficial results that have followed the removal of dental foci of disease, some of which are of extreme interest.

Personal experience is a good teacher and I obtained knowledge of the danger of dead teeth in this way. The x ray did not reveal the infection, but following their extraction troubles of long standing disappeared. It having been proved that dead teeth are potential factors in disease, what are we to say to patients who possess such? There is but one thing to say and that is—have them out.

In several articles which have been published, x ray findings have been given to show the relations of teeth to certain diseases, but nothing is said about the standards which govern the röntgenologist when he says that teeth are all right. This might be very misleading as it is common knowledge that infection, following extraction, is demonstrated with a negative x ray report and unerupted third molars are probably always infected, even though not read on the film.

We hear criticism of the relations of teeth to disease in cases cited where extraction was done without benefit, which is not evidence that attempted removal of infection was not justified, but emphasizes the necessity of the surgeon's knowledge and skill in obtaining the best results. We think that the time is not far distant when specialization in dentistry will be more general.

The remarkable resistance which some people possess against the invasion of all diseases is something we would like to be able to give to our patients, and although we may not succeed in so doing, except in a limited degree, we think that a removal of Streptococcus hemolyticus or Streptococcus viridans from the blood stream, with disappearance of the lymphocytosis, would better enable our patients to fight other invaders when they appear.

As a help in the campaign of education let us formulate a method of procedure that all will agree is proper and then use influence to have these methods put into practice in hospitals and public institutions. The plan should include removal of all roots, badly decayed and devitalized teeth, with due regard to surgical cleanliness, but if all cannot agree as to the devitalized tooth, let us begin with old roots and badly decayed teeth. Although this method would be crude, it would focus attention on these things and would probably lead to a proper equipment for study and treatment not unlike that maintained in the State Hospital at Trenton.

The present work done in some of our State institutions along the line of dental hygiene is a farce. How can you expect the indifferent physician to change his attitude so long as his patients, in the hands of specialists, have so little attention given to these infections?

Those who have had repair work done, be they sick or well, should have existing infection removed. In cases of severe illness, where repair work has been done, do not take it for granted that infection is nonexistant, if not apparent, for just as the miller does not see everything that floats by the mill, so the little streptococci sometimes gets by the röntgenologist.

Hippocrates said: "There are really two things, knowledge and opinion, of which the one makes its possessor really to know, the other to be ignorant," so today the physician, who is observing the effects of removal of dental infection, knows that a large number of patients are benefitted by this treatment. Having gained this knowledge by observation, he foresees the larger field for practical application of this knowledge, and a disappearance of many diseases the physician and surgeon are now called upon to treat.

Present Status of the Pulp and Root Canal Problem

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Looking through the writings of some eminent physicians during past centuries we occasionally find a reference to the injurious effect of diseased teeth on health. In 1818 Dr. Benjamin Rush, who was connected with the University of Pennsylvania, was so impressed with the importance of this subject that he made a very valuable contribution in reference thereto. The sporadic efforts of such few physicians of note calling attention to this matter left practically no imprint on medicine, because their observations were of a purely clinical nature, and empirical at that.

While studying medicine in 1879 my attention was directed by my father to the deleterious effect on people of the absorption of pus in the mouths of many patients who came under his observation. From that time my attention has been constantly directed to the efforts being made, not only to prevent such conditions, but to provide the proper means of curing diseased conditions caused by dental focal infections and still preserve the natural teeth so that they will not be a menace to the health of the individual. In 1882 Sir Lawson Tait, the celebrated gynecologist of Birmingham, England, came to the United States at the invitation of Dr. Albert Vander Veer, of Albany. A number of ovariotomies, which he performed at the Albany Hospital, were the first demonstration in this country of present day aseptic surgery. Having the honor of assisting at these operations, I was at once impressed by the beginning of a new era in aseptic surgery, and from that time have modeled the technic of all root canal operations on a similar basis of absolute asepsis.

At this period the recognized dental practice for the prevention of suppuration in root canals was the use of either carbolic acid or creosote. The latter was the one mostly favored and the most foul smelling that could possibly be found was the one that was considered to have the greatest virtue in its ability to disinfect the parts on which it was used. The use of this agent has never been abandoned by a large number of practitioners, and today its odor, which lingers about the office, is sufficient evidence that the practitioner still follows this antiquated procedure.

In the early eighties I started an endeavor to impress both physicians and dentists with the relationship that existed between infections in the dental regions and the general health of the patient. Although I wrote numerous articles on this subject, in which I called attention to the localized pathological dental conditions due to different types of malnutrition and to the various diseases caused by dental focal infection, my observations received but scant attention. It was not until Hunter, of London, aroused the medical world to the damage done by septic dentistry that the medical world as a whole realized the gravity of the situation.

The lack of dental education in the medical curriculum has ever since caused the medical men to blunder about this situation in an empirical manner. In the first place he has failed to grasp the difference between septic conditions in the mouth that are purely symptomatic of different types of malnutrition, the local pathological conditions which are generally known as pyorrhea alveolaris, and dental focal infections which are generally caused by infection of devitalized pulps in teeth. It is this latter condition which has been productive of so many cases of heart lesions, arthritis, etc., and has caused the physician to revolt against the orthodox methods of the dentist in handling pulpless teeth. Clinical demonstrations have proved beyond doubt that frequently unnatural rises in blood pressure, various types of heart lesions, arthritis, nephritis, diabetes, gallstones, ulcers of the stomach, appendicitis, etc., were unquestionably caused by the absorption of the toxins, the result of streptococcal foci nurtured by decomposing pulp tissue.

Although many able dentists have been working steadfastly to maintain a technic of therapy that would leave a pulpless tooth in the jaw in such condition that it ceased to be a menace to general health, they have failed to gain a sufficiently large following. This failure of the mass of dentists to take up scientific root canal therapy is due to a number of causes. Economic pressure has perhaps had the largest influence in preventing the mass of dentists from adopting a scientific root canal technic. This technic involves the removal of every particle of pulp tissue found in the root. It means the eradication of any diseased area in the alveolar structure around the end of the root. It means maintaining the root canal in an absolutely aseptic condition. It means hermetically sealing the end, thus insulating the root canal from the living tissue, so that no microorganisms could gain access to the canal from the surface of which they might obtain sustenance. An operation of this kind requires infinite patience together with absolute sterility of technic, and requires such a vast amount of time for its successful accomplishment that of necessity it has to be subdivided into numerous operations, all of which have to be checked up bacteriologically and by the x ray. The expense of such an operation, on account of the time expended, has unquestionably prevented the mass of the profession from undertaking its study. The delicacy of manipulation and the skill required, to say nothing of the temperament required for such an operation, has precluded absolutely a certain portion of the profession from successfully attempting it. This meant that the general mass of dentists continued in the orthodox method of handling pulpless teeth without regard to the possible damage they were inflicting on their patients.

As the evidence of danger to life itself began to be unfolded in the various professional articles that were published and lectures that were delivered, the conscience of many dentists revolted and there was started what was known as the "one hundred per cent. club," that refused to retain any pulpless teeth in the mouth. This, in turn, was followed by a wave of wholesale extraction of teeth which carried in its wake the loss of countless useful teeth. During the past few years the "one hundred per cent. club" has been steadily losing ground. A more or less concerted activity has started to prevent the wanton destruction of so many useful teeth. While it is true that balanced in the scale of judgment a healthy heart is of infinitely more importance than the retention of a tooth, we must not lose sight of the inordinate value that healthy teeth have in a healthy mouth for the proper maintenance of health. No artificial teeth, however skillfully constructed, are an ideal substitute for the natural organs, although they may serve a very useful purpose.

This revulsion of the feeling of the mass of the profession against wholesale extraction of teeth has unfortunately brought into the limelight of clinical activity the commercial instincts of various dental supply houses. As a result various schemes are attempted by means of which the lure is held out to the dentist of saving pulpless teeth in a manner that will not compel him to devote any such unusual amount of time, energy and skill.

This lure consists in the presentation of different methods of embalming the pulps, or whatever remnants of the pulps may remain in root canals. The object of the vendors is the sale of different types of proprietary remedies disguised under various fanciful names and hidden by different commercial schemes. That is what the public have most to fear from at the present time.

What is the remedy? Dentistry is a specialty of the healing art for the practice of which there is requisite so many different types of skill that it necessarily has become divided into specialties of its own. One of these specialties is especially distinguished by the remarkable benefits it has conferred upon humanity during the past twenty years. Before that time the correction of malformation of the mouth, irregularities of the teeth, and deformities of the jaw was practised more or less by the general practitioner. The result of such practice on the whole was more or less disheartening. When, however, orthodontia became a well marked and distinctive specialty practised by men especially educated therefor, to the exclusion of every other type of dentistry, it succeeded in producing a result that was nothing short of marvelous when compared with the conditions prevailing thirty years ago. The able orthodontist of today is one of the greatest apostles of successfully practised preventive medicine.

Every investigating dentist and physician can find the absolute proof that a certain percentage of pulpless teeth can be treated in such a manner that when the operation is completed they cannot be in any way regarded as a menace to the health of the individual. The only way in which the public as a whole will obtain the benefit of such treatment will be when the treatment of pulpless teeth becomes as much of a specialty in dentistry as orthodontia is at the present date. When the dentist who feels a desire to follow this particular field of practice devotes a sufficient amount of time to a course of instruction in this specialty, and then devotes himself entirely to the treatment of such conditions as would come under such a specialty, the public will be materially benefited.

Although our dental schools are working diligently to improve the situation, it cannot be denied that the great majority of dentists are lacking in a proper understanding of general pathology. They look upon their calling mainly as one of craftsmanship and feel that any unsuccessful operation reflects on their ability. Every surgeon realizes that every operation performed with all possible skill is attended by a certain percentage of failure for which he cannot be held accountable. Not so with this class of dentists; fearlessly they undertake pulp operations and often having operated with great skill meet with failure. Like the general surgeon they should frankly admit the failure of the operation. Unfortunately they have not been educated as physicians but as artisans, and fear that the admission of failure will not only injure their professional reputation but will possibly make them defendants in various malpractice suits.

It must be understood that a large percentage of pulp cases may result in failure and yet not leave a trace of discomfort. Generally, there is no exterior evidence of failure. Only the bacteriological laboratory and the x ray will disclose the fact that the focal infection still exists. Fortunate is the patient whose dentist has the moral courage to inform him frankly of failure, and that the tooth must be removed and the diseased surrounding structures extirpated.

The percentage of failure in pulp operations varies greatly, dependent on certain conditions. The removal of a pulp where no infection exists should be successful in about ninety-five per cent. of cases. Where the infection has not attacked the alveolar structure, but remains in the root canal, this percentage is only slightly decreased. Where destruction of the alveolar structure has begun, but the investing pericemental lining membrane of the root remains intact and no prior operation has been performed, the percentage should be well above eighty.

Wherever a prior operation has been performed it becomes very difficult to make an estimate of the possible percentage of success. Whenever the cementum of the root has been attacked and destruction of the cementum begun, the prognosis is very bad. Few men of ability will operate under such conditions. Nevertheless, in such cases operations have been successful.

We have learned to base our diagnosis of foci of dental infection in a large measure on the destruction of alveolar structure around the end of the root. Like the remainder of the body, the destroyed alveolar structure is regenerated when the pathogenic tissues have disappeared. To feel confident in assuming that the operation was successful the x ray within the year should disclose regeneration of previously destroyed alveolar structure.

38 East Sixty-first Street.

Vincent's Infection of the Mouth*

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In recent years Vincent's infection has been written up extensively and profusely. Its frequent occurrence during the world war among soldiers and sailors, at home and abroad, and even among civilians, stimulated the dental and medical professions to great activity in its study and the recording of its diagnosis, etiology, and treatment. Assuming that the subject is a more or less familiar one, I shall give only a brief review of it as a whole and discuss more fully those points which I consider either have not been brought out hitherto or have not been sufficiently emphasized.

The term Vincent's infection was recommended at the last meeting of the National Dental Association by the Committee on Nomenclature, and refers to the disease of the mouth supposedly caused by Vincent's fusiform bacillus and spirillum appearing jointly either in symbiosis or as variations in form of the same organism. Their true relationship has not yet been definitely established. Until recently this disease has been variously known as ulceromembranous gingivitis (Grieves), phagedenic gingivitis, Vincent's infection of the gingivæ, acute ulcerative gingivitis (Gilmer), phagedenic pericementitis, trench mouth, Vincent mouth, Vincent's angina, ulcerative gingivostomatitis due to Vincent bacillus, etc. At the present time we commonly designate the infection when in the throat as Vincent's angina, and when in the mouth as Vincent's infection.

Vincent's infection is both infectious and highly contagious. It may occur either in pure form or mixed with other acute or chronic infections of the mouth. Because of this latter fact, a detailed knowledge of all the clinical symptoms of Vincent infection is indispensable to the stomatologist. It is most prevalent in individuals between the ages of twenty and forty (occasionally occurring before twenty but rarely after forty) and is found more often in men than in women. It is not apt to invade a mouth in which excellent hygiene is maintained.

ETIOLOGY.

In addition to the virulence of the Vincent microorganisms, the other factors required for the establishment of the infection seem to be a coincidental general lowered resistance plus a suitable local soil in which these microbes may gain a foothold. Close observation in practically all cases of Vincent's infection will disclose the fact that, primarily, these organisms attack and spread from those areas of the soft tissues in which circulation has been previously impaired by mechanical, chemical, or bacterial trauma. It will also be found that these foci are so situated that the bacteria are protected from the cleansing action of mastication and from the usual haphazard use of the toothbrush. The following may be such locations: The flap of gingiva partly covering the lower third molar; the acute angle formed by a sharply inclined drifting tooth; the interproximal gingivæ where teeth overlap and form emphasized embrasures; buccal gingival margins of second and third upper molars, the lingual gingival margins of second and third lower molars, and on the mucous membrane of the cheeks or tongue or floor of the mouth immediately adjacent to these points; near the overhanging margins of faulty dental restorations; the gingivæ covering teeth which are either in marked traumatic occlusion or in infraocclusion; palatal margins of the anteriors where the gingivæ are constantly inflamed by mouth breathing or by excessive smoking, especially of cigarettes; and in preexisting interproximal pyorrheal pockets.

CLINICAL SYMPTOMS.

The following are the outstanding clinical symptoms: Ulceration and sloughing of the marginal gingivæ—especially interproximally. The necrotic layer, yellowish white or grayish white, may be easily wiped off from its base or red line of demarcation which is highly inflamed. Immediately below this line the gingiva may appear fairly healthy. This red base is extremely sensitive, painful, and bleeds freely on the slightest provocation. The ulceration may occur on the mucous membrane of any other part of the mouth and throat in the form of yellowish white or grayish white patches with well defined inflammatory margins. Usually the bacteria invade the gingivæ in various parts of the mouth at the same time, but they may confine themselves to one side of the mouth, either right or left, involving the upper and lower jaws on that side. The fetid breath almost always present is distinctly characteristic and easily differentiated from other types. These symptoms usually come on suddenly and are often accompanied by a metallic taste, increased salivation, swelling of submaxillary lymphatic glands, also malaise, rise in temperature, and mental depression. (In reference to the last named symptom, it may be interesting to note that within one week, each of two women patients suffering from a Vincent infection indicated her state of mind in exactly the same words, "If it were not for my small children, I would jump into the river." In both cases, the point of view was changed at the second visit.)

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*Read before the Hudson County Dental Society, Jersey City, N. J., March 2, 1923.

Although one would logically expect to find that the intensity of the systemic symptoms is proportionate to the extent of the local symptoms, the contrary is sometimes true. Instances have been observed in which fairly advanced cases produced comparatively minor systemic reactions while those with mild local symptoms exhibited decided systemic derangement. As a general rule most of the above named symptoms are found in the mouth presenting the typical, acute Vincent's infection, but there are cases which present only a few, some of the symptoms considered cardinal even being absent. This fact should be emphasized, as there seems to be a general impression that all or most of the symptoms must be present in order to make a positive diagnosis of a Vincent infection. In fact I know of some instances in which a wrong diagnosis was made by dental and medical practitioners simply because they were misled by the absence of some of the symptoms.

The bacterial findings in the average case are strongly positive, i. e., a great number of fusiform bacilli and spirilla are found. However, the following interesting variations have been observed: the first smear taken in an incipient case showed a heavy bacterial count, while in a similar case the first smear yielded no Vincent finding—though typical findings were obtained several days later. On the other hand, in a fairly advanced case the primary smear was negative.

Another point in diagnosis which should be emphasized at this time is the fact that positive bacterial findings are not in themselves conclusive. Mouths showing no symptoms of an acute Vincent infection, either subjective or objective, may often show the presence of Vincent microorganisms in large numbers. A table of smears which I took from seventy-five mouths, chosen at random from among my patients, having no clinical manifestations of Vincent infection, shows the following findings:

No Vincent bacilli and spirilla present	24
Spirilla only	12
Bacilli only	1
Moderate number of Vincent bacilli and spirilla	32
Large number of Vincent bacilli and spirilla	6
Total	75

Therefore, the presence of a large number of Vincent bacilli and spirilla does not by itself denote an acute disease, though it may indicate a possible mild, chronic infection. It may, however, be a predisposing factor of disease and the bacteria should be eliminated or at least reduced in number as a preventive measure.

It may be in place, under clinical symptoms, to mention the following variations which I have observed in several instances:

1. The bright red line of demarcation, instead of terminating abruptly, continues into the alveolar gingiva towards the areolar mucosa, with a gradually lessening intensity until it merges with the normal pink.

2. The gingival margins were intact and not necrotic, but the entire affected gum was cyanotic in appearance, slightly bloated, and extremely painful to touch. The condition responded to Vincent treatment with a rapidity characteristic of a Vincent infection. The bloated gingivæ collapsed immediately, assuming a wrinkled appearance, and the pain was eliminated almost completely. Then the gingivæ rapidly resumed their normal color, form, and consistency, leaving no trace of the bluish color.

3. When the margin of a flap of gum overlying a preexisting pyorrheal pocket is affected by an acute Vincent infection, the red line of demarcation is very often not discernible—the necrotic area is in apparent contiguity with the bluish gingival flap.

DIFFERENTIAL DIAGNOSIS.

Vincent infections in which only a few of the typical symptoms are present may be mistaken for other lesions having similar characteristics. As I have found that a bacterial finding, either positive or negative, is not an absolute guide in diagnosing a Vincent infection, I feel that a clinical differential diagnosis is of vital importance.

Among the lesions most likely to be diagnosed as Vincent infections, or vice versa, are:

1. Pyorrhea alveolaris (suppurative periodontoclasia)
2. Mercurial stomatitis.
3. Aphthous stomatitis.
4. Mechanical trauma.
5. Staphylococcus infection of the mouth.
6. Lesions produced by drugs.
7. Tuberculosis.
8. Syphilis.
9. Pemphigus.
10. Diphtheritic sore throat.
11. Herpetic lesion.

1. *Pyorrhea alveolaris.*—In pyorrhea alveolaris macroscopic pus is usually disclosed upon pressure on the gingiva, with no pain except when complicated by an acute infection, such as a parietal or gingival abscess. It does not present any necrotic gingival margin and the loss of peridental tissues may be on any or all sides of the teeth. In the pure type of Vincent infection there is no macroscopic pus in evidence and the gingivæ are very painful to the touch—in fact, mastication on the affected parts becomes impossible. The marginal gingiva is necrotic and the destruction is found particularly between the teeth.

2. *Mercurial stomatitis.*—Ulceration has a dark grayish blue appearance and there is no special tendency towards interproximal ulceration as in the Vincent infection. The devastating process occurs on the gum margins all around the teeth equally and the inflammation may extend down to the areolar mucosa, whereas in Vincent's infection it usually does not extend much beyond the bright red line of demarcation. Marked necrosis of the bone occurs more often and loosening of the teeth is more likely to occur in mercurial stomatitis than in the Vincent infection. Besides, salivation may be more marked and the tongue often swollen. History of the condition indicates the use of mercury in some form either by mouth or intramuscularly.

3. *Aphthous stomatitis.*—This condition is most likely to occur away from the gingivæ proper. The necrotic material is very tenacious and lighter in color than that of a Vincent infection. There is

likely to be a history of indigestion and a complaint of socalled heartburn. In contrast to this, Vincent lesions occur most often on the marginal gingivæ and the necrotic material can be detached very easily (wiped off).

4. *Mechanical trauma.*—The careless use of a tooth brush, food impaction, artificial dentures, bridges, etc., may cause trauma. The condition simulates aphthous stomatitis in appearance and painfulness.

5. *Staphylococcus infections.*—Infections of the oral mucosa with the staphylococcus, as I have observed them, are small ulcers resembling aphthous sores in color and painfulness, are sometimes round, but generally oval, and are a little larger than a pin head. They occur mostly as groups of individual lesions but at times coalesce. They appear on the palate, gingivæ, and on the inner side and the vermilion of the lips. They are not especially inclined to affect the gingival margins or interdental papillæ. They resist treatment very stubbornly and when they appear with a Vincent infection, they respond more slowly than the latter lesions.

6. *Lesions produced by drugs.*—Luminal used in nervous conditions as a sedative may cause lesions in the mouth simulating those of the Vincent infection. Phenolphthalein, ex-lax, phenol-lax, and certain coaltar products may act in the same way. The eruption is that of a bullous type and the small bullæ may be seen in the early stage. The ulceration is more inflammatory. There is usually a complete history of the ingestion of drugs in nearly all cases.

7. *Tuberculosis.*—In neglected and aggravated cases, ulcerations of the checks, gums, or tongue may occur. They are characterized by ragged edges, with a dirty gray pultaceous base, studded with small tubercles, which show tubercle bacilli on microscopic examination.

8. *Syphilis.*—The mucous patches of syphilis are more or less sharply demarcated, are of a grayish white color, on a noninflammatory base and are not very painful. There is usually a history of a recent infection or the presence of a primary lesion with other secondary manifestations of the disease, as well as a positive Wassermann test.

9. *Pemphigus.*—Cases of pemphigus, in their early stages, where the lesions of the mouth antedate those of the body by months, have been diagnosed as Vincent infections. When the bullæ characteristic of pemphigus are undisturbed, Vincent infection is easily ruled out, but where they have collapsed, the bases may resemble Vincent ulcers. However, strands of the deflated bullæ are apt to be left around the margin of the base. There is also no probability of marginal and interproximal destruction of the gingivæ.

10. *Diphtheria.*—A pseudomembranous exudate in the throat is of a dirty gray color, is strictly adherent, and rarely appears around the teeth. There are constitutional symptoms and the positive findings of the Klebs-Loeffler bacillus in diphtheria.

11. *Herpetic lesions.*—These appear as distinct isolated vesicles at the beginning. The eruption usually improves after a few days even without treatment and the microscopical finding is negative.

The question, "What drugs do you employ in the treatment of Vincent's infection?" sounds about the same to the clinician as the one heard so frequently, "What scalers do you employ in the treatment of pyorrhea (suppurative periodontoclasia)?" Both questions often indicate the mistaken idea that drugs and scalers are the means of curing these diseases. The fact really is that they are only valuable aids to other almost equally important factors in a successful treatment. Medication in a Vincent infection is directed against the pathological microorganisms only and should be accompanied by painstaking efforts to restore the immunity of the mouth and to improve the general resistance of the patient.

Treatment is therefore carried out by me as follows: At the first sitting all necrotic material is removed as lightly as possible, either by picking it off with cotton pliers or, preferably, by wiping it off with a tapering swab of cotton, on the end of a toothpick, saturated with a ten per cent. solution of neosalvarsan in glycerine. The patient is asked to obtain, immediately upon leaving the office, an original one pound package of sodium perborate with which to make a solution—one teaspoonful to three quarters of a glass of tepid water—to be used every half hour until otherwise instructed, rinsing the mouth thoroughly with the entire contents each time, and forcing it through between the teeth. Where systemic disturbances are manifest, the patient is advised to take a saline cathartic at once, to use a light diet, to rest as much as possible, and if necessary to stay home from work. Superficial scaling of the teeth, though sometimes advantageous at this sitting, is not often undertaken at this time for the following reasons: the patient is usually physically unfit for a long session; the first visit is apt to be an emergency treatment and therefore necessarily short; and also because the odor is too obnoxious to allow the operator to work at close range for the additional time required. Notwithstanding the unhygienic condition of the mouth, tooth brushing is not encouraged at this time and the patient is asked instead to use gently a swab of cotton soaked in the perborate solution. Smoking is temporarily prohibited.

Almost without exception, the patient returns the next day entirely changed in spirit, alert, and highly appreciative of the sudden marked improvement. He has had a peaceful night's sleep and the systemic symptoms may have disappeared entirely. The ulcerous conglomerate, if developed afresh, is greatly diminished in quantity, and the pain and sensitiveness in the soft tissues are reduced in proportion. At this, the second visit, the operator usually does his superficial scaling and removes all marked traumatic and unsanitary conditions. Neosalvarsan is again used and daily thereafter, until several days after the complete disappearance of the necrotic lesions. When the acute condition seems to have subsided, further scaling is undertaken. Tooth brush instruction is then given the patient who must be made to understand the great importance of thorough brushing, particularly in the interdental spaces. Use of the mouth wash is continued for approximately two months in conjunction with the tooth brush dipped in it, about twice daily, as a precautionary measure against reinfection, and the patient is requested to call fairly often for inspection during this period.

Above all, immediate and intensive treatment is imperative because of the very rapid progress which characterizes this infection, so as to prevent either a fatal termination or such extensive destruction of periodental tissues as to require extraction of the teeth. To insure best and earliest results, treatment by the operator and cooperation by the patient must be carried out from beginning to end with relentless precision. Otherwise, progress is retarded and permanent loss of the investing tissues increased, to the patient's disadvantage.

All surgical operations, such as tooth extractions, should be postponed until after the complete elimination of infection, in order to avoid serious effects.

Vincent infection is generally spoken of, written about, and thought of, as an acute infection. It is one of the purposes of this paper to call attention to the fact that the activities of the Vincent microorganisms may produce acute, subacute or chronic conditions of the gingivæ, and I have a strong suspicion that these organisms may act similarly in the throat, using the dental arch perhaps as a base for their activities.

The subacute condition may be the result of incomplete treatment of an acute infection or it may never have been acute at any time. It may have many of the features of the acute condition but is not so distressing. It may flare up and disappear after a few days without any effort at treatment, only to reappear in the same way several weeks or months later, the balancing factor being, evidently, either the patient's physical condition or the virulence of the microorganisms. It may be accompanied at times by a slight rise in temperature and a mild malaise, and may also present a slight tendency towards a necrotic margin. On the other hand, there may be no macroscopic necrotic tissue in evidence at any time, yet the loss of tissue, especially interproximal, and the red gingival margin simulate the characteristic appearance of the acute infection minus the necrotic border. In some cases the outstanding feature which makes the patient aware something is wrong, is the easily produced hemorrhage.

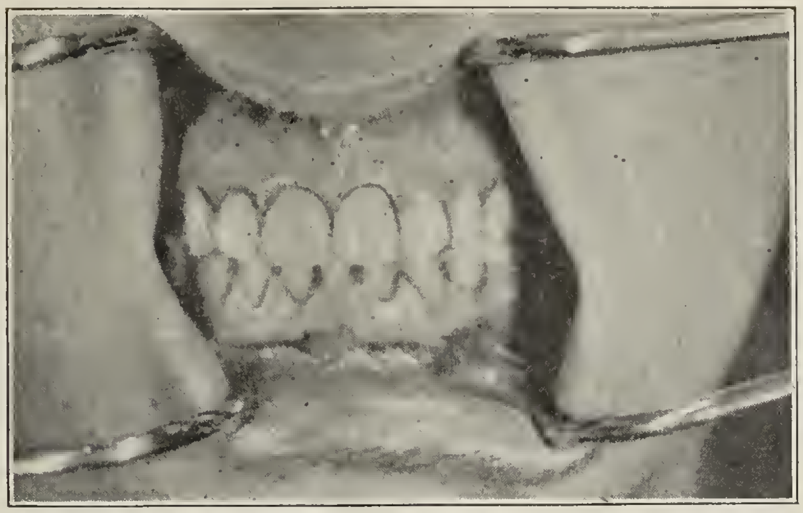
Fig. 1.—Normal gingivæ. The interproximal papillæ reach down to the contact points of the teeth.

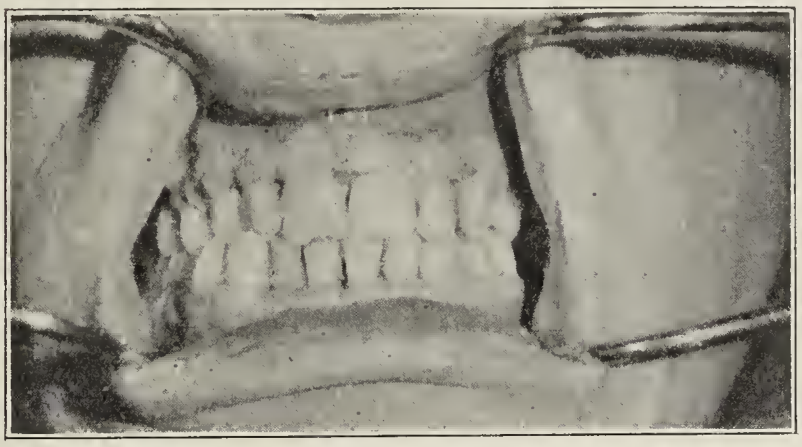
Fig. 2.—Destruction of interproximal papillæ in a case of Vincent's infection. This photograph was taken at the second visit. The only necrotic tissue appearing this time was at the point of the central papilla.

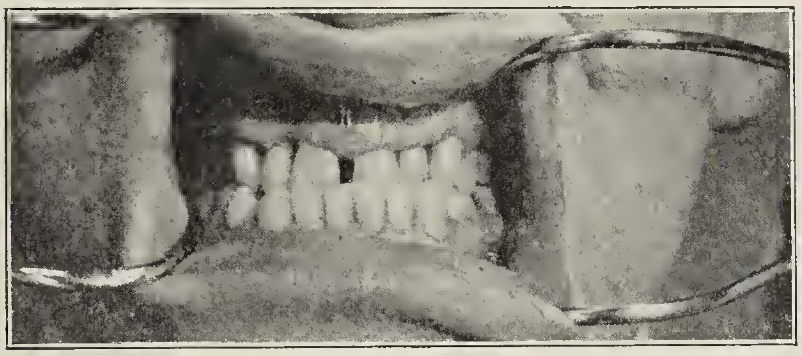
Fig. 3.—Typical condition of the gingivæ in the wake of a fairly advanced case of Vincent's infection.

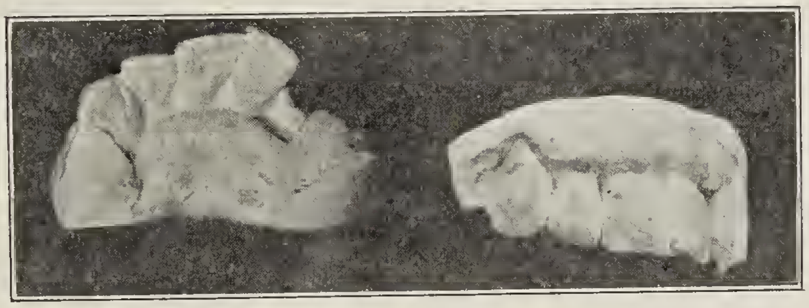
Fig. 4.—Models showing the extreme loss of supporting structures in an advanced case of Vincent's infection.

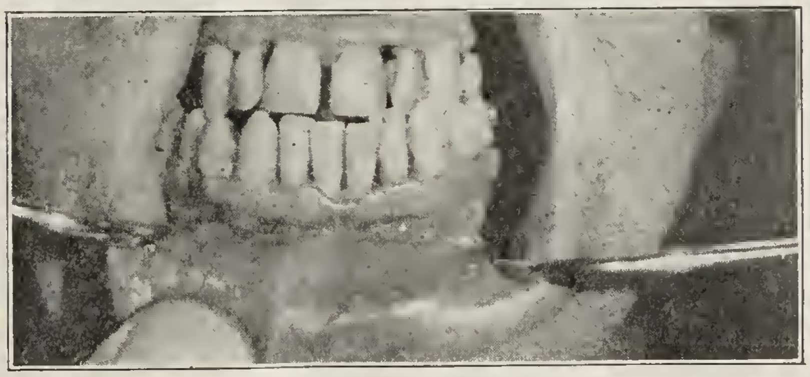
Fig. 5.—Showing appearance of marginal gingivæ in Case II.

Treatment of the subacute type is the same as for the acute and with the same intensity. The following two cases represent this type:

Case I.—Male, aged twenty-four, merchant, came to me for treatment about six months ago with a mild Vincent infection in which there was a slight sloughing of interproximal papillæ and Vincent finding was positive. He was in barracks during the war and since then intermittently his gingivæ were sensitive and bled easily and he suffered from high temperature and malaise. He had his teeth cleaned a year ago, after which the gums were sore for an entire month and sore intermittently thereafter until two weeks prior to his first visit. Response to Vincent treatment was prompt and patient has been feeling well since that time.

Case II. — Physician, aged about thirty, had been in active service in the war. While in the trenches he had neglected mouth hygiene and the gingivæ became uncomfortably sore toward the end of his stay there. Without any special treatment this condition disappeared but had since then reoccurred intermittently, accompanied each time by marked malaise, a noticeable rise in temperature, and extreme fatigue at the end of a day's work. When he came for treatment several months ago, the marginal gingivæ presented the appearance of an acute Vincent infection minus the necrotic tissue but with marked loss of interproximal papillæ. Other Vincent symptoms were also present. In this case the first smear taken was negative, the second one, taken the next day, was slightly positive. After the discontinuance of toothbrushing for two days, a third smear showed a positive Vincent infection. Response to Vincent treatment was prompt.

The following cases are interesting examples of some of the points discussed:

CASE III.—Female, married, aged twenty-four, in an automobile accident, had broken her upper left central and lateral incisors and had sustained other contusions about the face. She was confined to bed as a result of the shock and had considerable rise in temperature for about a week. Salivation became very marked and all the now loosened upper anterior teeth and their surrounding soft tissues became very painful. Fluoroscopic examinations, together with these symptoms, led the attending physician to diagnose the case as a fractured maxilla.

The patient was at this time referred to me for consultation and treatment. She was so weak that she was hardly able to walk and her extreme pallor indicated a very sick condition. The painful condition in her mouth rendered hygienic care impossible and it was consequently in a very unsanitary state. Radiographic findings this time revealed no fracture. The cemental and alveolar gingivæ, labially, showed ulcers of apparently mixed infection. These ulcers were also to be found on the vermillion of the lips and they were especially painful where the lips were chapped. Some of these ulcers were isolated while others were fused. Marginal gingivæ and interproximal papillæ showed typical Vincent infection around the entire mouth, but the destruction was not deep. The breath was extremely fetid. Bacteriological examination showed many fusiform bacilli and myriads of spirilla, also a moderate number of staphylococci. The Vincent symptoms yielded readily to treatment, but the other ulcers disappeared slowly.

CASE IV.—Male, automobile mechanic, aged twenty-seven, when presented at the clinic had all the characteristic symptoms, both subjective and objective, of a fully established Vincent infection extending over the upper and lower anterior teeth and over those of the right side, while the left side, distal to the canines, was apparently not infected. Bacterial findings were positive. Patient responded to treatment rapidly and at the end of ten days his mouth appeared so well that he was told to reduce the intensive home treatment and to report a month later unless he should feel discomfort in the meantime. He came back within one week and this time the left side of the mouth was infected while the right side seemed to be well. Although the patient was placed under the same treatment as before and directions were followed out by him with the same precision, the infection this time continued to spread until the entire mouth was invaded, including the part that had previously been cured. Now, what seems to have occurred was that through enthusiastic catering to the diseased area, the hygiene of the remaining parts of the mouth had been neglected and the Vincent organisms allowed to flourish there until an inopportune lowered general resistance invited infection and also a severe cold. The patient admitted that he had neglected to take the usual care of the parts not diseased because he concentrated on the infected region. The cold started several days prior to the new infection, and it is interesting to note that as the severity of the cold subsided, the pathological symptoms in the mouth ran a parallel course. The contrast between the extremely rapid response to treatment during the first infection and the stubbornness of the second would seem to be due to the lowered resistance of the patient. It seems advisable, therefore, that coincident with local treatment, the general condition should be toned up.

Prognosis varies according to the stage at which proper treatment is instituted, the general health of the patient, and the extent of cooperation. Although a mortality is occasionally reported, this infection yields readily, on the whole, to proper treatment. Where destruction of interdental papillæ is mild, the slight concavities found in the wake of the destruction eventually become convexities, thus simulating the original papillæ except that they are slightly shorter. They retain their function of protecting the interproximal surfaces from decay. Where the papillæ have been destroyed to a greater extent, and with them the alveolar crest, we may expect a filling in of the soft tissue, to the rim of the pocket thus formed. This leaves the cementoenamel exposed to the action of acids and bacteria, and for a time to thermal shock. This condition, though not esthetic, is usually bearable, providing the patient learns to use the interproximal method of tooth brushing and so prevent sensitiveness, caries, and a possible pyorrheal infection. An interesting process of regeneration does occasionally occur, however, through proper postoperative treatment, i. e., new tissue grows up from the bottom of the pocket, and filling the space, grows beyond the rim of the pocket to such an extent that it eventually becomes a fair substitute for the original papillæ.

Where the interproximal tissues have been destroyed to an extreme extent, permanent comfort and health are very often restored only by extraction of the teeth. In such instances, if only two teeth next to each other are involved, in any area, extraction of one may save the other. This condition is likely to be found where deep pyorrheal pockets had existed prior to the acute infection. Buccal, labial, and lingual gingivæ usually regenerate very slightly, but they have a tendency to lose their jagged edges and return to the graceful curve of the normal margin. Where deep destruction of the alveolar mucosa (the mucous tissue overlying the ridge formed after tooth extraction) occurs adjacent to a tooth, remarkable regeneration may take place.

I wish to express my grateful appreciation to Dr. Isadore Rosen, assistant professor of dermatology and syphilology, Columbia University, for his kind assistance with the differential diagnosis, and to Dr. T. S. Schlauch, pathologist to the New York Throat, Nose and Lung Hospital, for his examination of the slides upon which the table was based.

Two additional cases will be included in the author's reprints.

Oral Infection by Vincent's Organisms

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Vincent's angina is an infection of the throat whose nature and etiology have long been known to the medical profession. The appearance in the mouth of the causative organisms of this disease has also been known for some time. Previous to the world war, infection of the oral tissues by the spirochete and fusiform bacillus of Vincent was comparatively rare. The result was that it received but little attention from either dentist or physician. When so occurring, this disease was labeled pyorrhea, and thereby grouped with several other types of periodontal diseases, to which this name was equally inapplicable. The name phagedenic gingivitis (1) has been applied to this disease because of the rapidly spreading ulceration which is one of its characteristics.

When it was recognized that this disease constituted a distinct type of oral infection, the identification of the causative organisms was made. Their characteristics, as a symbiotic, anaerobic group, were soon established. Although attention was called to this by several dental writers, notably Vaughan (2), Hinman (3) and Grieves (4), the essential nature of this disease remained an unknown quantity to dental practitioners in general until the infection reached epidemic proportions during the world war. Its ravages were not confined to the army and navy but were fairly widespread in the civilian population, especially in the large cities.

The disease is characterized in the typical case by sudden onset, the attack being that of a painful inflammation localized along the margin of the gingival tissues and involving especially the gingival tissue between the teeth. The inflammation is of so violent a character as quickly to cause an ulceration of the border of the gingiva, characterized by the formation of a greyish white slough. In the neglected mouth, or in one presenting evidence of a previously existing chronic disease of the gingival tissues, extension of this area of ulceration may take place with surprising rapidity. The slough may extend rootwise over the buccal or lingual gingivæ, and may thus by extension involve the mucosa of the cheek or the floor of the mouth. Seldom, if ever, does an ulcer appear in these locations as the initial point of infection. The greyish white slough, which consists chiefly of necrotic epithelium, may often be removed with an instrument. Upon removal, a bright red hemorrhagic surface of granulation tissue is exposed, which in the absence of treatment breaks down quickly and forms another necrotic slough.

Due to the rapidity of this process, the bloodvessels early become involved, resulting in hemorrhages, both spontaneous and induced. These hemorrhages may take place during the night and when so occurring are a definite diagnostic sign of the disease.

The breath acquires a characteristic foul odor, which is frequently recognizable even in the absence of acute symptoms. Sleeplessness and loss of appetite are common, as is also the occurrence of some degree of fever. There is a decided malaise, although the patient is seldom confined to the house or even incapacitated for work. The violent nature of the attack induces an apprehension as to the nature and outcome of the disease.

It is most common in those whose mouths are neglected. Cigarette smokers seem particularly susceptible. Syphilitics are likewise extremely susceptible, although the infection may occur without association with this disease. This fact is mentioned because so many patients manifesting Vincent's infection have been improperly suspected of having specific disease. It is, nevertheless, true that antisyphilitic medication, especially arsphenamine, is effective in its treatment.

During the acute stages of the attack and because of the alarm which it causes, the family physician is frequently called before the dentist is consulted. Also, this infection not uncommonly occurs in the mouth of a patient suffering from some confining disease. The physician must, therefore, be able to make a diagnosis and in many cases give such treatment as will serve to ameliorate the symptoms. The case should, however, be referred as early as is feasible to the dentist. The reason for this is, that many of the predisposing causes are of a purely dental character. Therefore complete resolution is not to be looked for except through treatment for which the dentist is especially trained.

Since the exciting cause is an infection by bacteria, it follows that any efficient nonirritating antiseptic will give beneficial results. Emphasis is to be laid on freedom from irritation quite as much as on the efficiency of the drug. For instance, escharotics, including tincture of iodine used alone, are positively contraindicated. Astringents also are of but little value. On the contrary, it has been found that a combination—an aqueous solution of iodine, such as Churchill's, in combination with twenty per cent. silver nitrate—is particularly effective. The iodine solution is applied by any convenient means, as, for instance, a pledget of cotton, followed immediately on the wet iodine by a similar application of the silver nitrate. The result of this application is to produce a precipitate of silver iodide upon the tissues, the chemical interaction eliminating the irritating effects of each drug. This application may be repeated at intervals of two days, if found necessary, but should not be applied over a long period of time. The application should be made directly upon the ulcer.

Sodium perborate is prescribed as a mouth wash, the directions being to dissolve a teaspoonful in half a glass of water as hot as the patient can comfortably bear it. This is used at intervals of half an hour, or less often, according to the severity of the attack.

The sodium perborate must be fresh in order to be effective. Its efficiency lies in its power to liberate oxygen, since the Vincent's organisms are anaerobic in character. It has a greater value than peroxide of hydrogen as it liberates its oxygen more slowly. It is mildly alkaline in reaction and is therefore devoid of the irritating qualities found in the usual peroxide solution. Peroxide of hydrogen diluted with a mild alkaline solution may, however, be used if fresh sodium perborate cannot be obtained.

Many other drugs have been advocated for the treatment of this condition, such as chromic acid, a solution of arsphenamine and glycerine. The agents here recommended, however, have proved particularly satisfactory by reason of the rapidity with which they check the infection and the speedy relief from pain afforded the patient.

Among the underlying causes of this infection are the accumulation of calculus and other concretions upon the tooth surface; irritation of the gingivæ by tobacco smoke; the presence of rough fillings, edges of crowns, etc. Another important cause is the influence of an irregular application of stress to certain teeth in the act of mastication. This inharmonious action of the teeth when in function has been called traumatic occlusion (5). It has been called to the attention of the dental profession only during the last few years as a causative factor in socalled pyorrhea. It has also been found that this condition is a frequent factor predisposing to Vincent's infection.

Subsequent to the prescribed medication, the factors just enumerated should receive attention. The deposits are to be removed and the surfaces of the teeth polished. Traumatic occlusion, if present, is to be corrected.

The toothbrush which is the usual means of maintaining sanitation is contraindicated in the acute stage of the disease, since it causes laceration and irritation of the ulcerating gingival tissues. The patient may use instead a swab of cotton dipped in sodium perborate solution. This should, however, be supplemented by frequent cleansing by the dentist.

This disease may have a fatal termination in the absence of treatment. This seldom occurs, however, except in patients previously suffering from extreme debilitation, exposure to the elements, etc. Usually the natural resistance of the patient is sufficient to bring about an attenuation of the infecting organisms even in the absence of treatment, with the result that the infection becomes chronic and may lose nearly all its cardinal symptoms. Diagnosis may, however, be made through the identification of the spirochete and fusiform bacillus in the smear.

Intense as is the virulence of the acute attack, cases of Vincent's infection show a surprisingly rapid recovery when correct dental treatment is instituted. These same cases may, however, run a long course of acute and subacute symptoms in the hands of the inexperienced practitioner. The prognosis for this condition is nearly always favorable when a correct diagnosis has been made and proper treatment given.

The author's references will appear in his reprints.

Evolutionary Development of Reconstructive Dentistry*

By M. DIAMOND, D. D. S.,

New York,

I am an American, but I wish to speak to you, not as an American dentist to English dentists, but as a member of the dental profession to my fellow members. Art and science know no limitations of a geographical or national character; and dentistry which is a combination of both art and science must refuse to recognize such limitations. It is no longer remembered particularly that Shakespeare was English in an appreciation of his art all over the world, or that Rembrandt was Dutch; nor does the fact that Einstein is German prevent the award of a great universal tribute to a living individual for his scientific discoveries; and when administering general anesthesia for medical or dental purposes, we do not call to mind that Wells discovered its application and that he was an American.

That a nationalistic spirit does exist in dentistry we can not deny. We think and speak specifically of American dentistry as something quite apart and different from English dentistry. And yet we all have the same duty to perform, the same service to render, the same objective before us—to minister to the care and health of diseased tissues in the mouths of humans and to reconstruct destroyed parts as nearly as possible to meet with all the normal, anatomical and physiological demands placed upon us by Nature. The problems confronting the dental profession are too important to be interfered with by any nationalistic or tribal spirit, and an influence so retrogressive must be ignored.

Perhaps with the exception of feminism, dentistry is the youngest movement in existence. It received its first impetus from Pierre Fauchard early in the eighteenth century, a little less than two hundred years ago. I do not affirm that modern dentistry began with him, but rather that the dentistry movement began with him. Fauchard was a keen observer, and made ingenious attempts to contrive reconstructive methods, but unfortunately the backbone of reconstructive dentistry did not exist at the time. Fauchard's data were strengthened in the half century that followed by Robert Bunon, of France, Thomas Berdmore, of England, and by Philip Pfaff, of Germany, who, with the introduction of plaster of Paris, gave the first impetus to reconstructive dentistry. Berdmore gave the first impetus to dentistry in England, and one of his disciples, Woofendale, was, in 1768, the first recorded dentist in America. The scene of activity remained in England through John Hunter, who as a general surgeon contributed to the modern conception of both tooth anatomy and the physiology and pathology of all structures. His experimentations with plantations of teeth are well remembered. Indeed, he served to establish a scientific attitude that has been rigorously increasing in intensity.

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*Lecture delivered before the Royal Society of Medicine, London, July 25, 1921. A clinical demonstration followed the lecture.

And now the scene shifts once more to France, where toward the end of the eighteenth century mineral porcelain was conceived by Duchateau, a chemist, because of his sensitive reaction to the organic instability of the ivory substance of his denture and later applied by de Chemat. The enormity of this find is easily appreciated. The cornerstone of reconstructive dentistry was laid. This marked the beginning of a new century and a new era.

From this point I am constrained to refrain (with the probable exception of occasional references) from the consideration of the development of orthodontia, and of the histology, anatomy and pathology of teeth and the other component tissues of the buccal cavity. I shall also refrain from a consideration of the other branches of dental science, although the need of a thorough knowledge of all of them is imperative, even though one confine himself to the practical application of only one. But having prepared the soil from which reconstructive dentistry springs, it is meet that we now concern ourselves primarily with its growth.

We find, on summarizing the status of reconstructive dentistry at the beginning of the nineteenth century, that while it had received considerable impetus during the preceding century, it was nevertheless in a state of empiricism. The situation, however, began rapidly to take on new proportions. During the first half of the new century much was done to develop the industry of mineral porcelain, in texture, shading and anchorage. Today it is interesting to see some specimens fused by Asch and Sons about ninety years ago. They had evidently found, very early in their career, the secret for producing the most compact porcelain and the simplest and most effective system of anchorage. During this period porcelain teeth were used on metal bases adapted to plaster impressions, and with clasps adapted against naked teeth, served to present an appliance reconstructing any number of teeth. This represented a decided transition from the empirical to the scientific.

Toward the end of the third decade of the nineteenth century, dentistry in America was receiving its first impetus and the scene of activity remains in America for a time. Chapin Harris started the first dental journal among a register of only two hundred, and in 1839 the first dental school was organized. Reconstructive dentistry gathered much momentum in the decade following, with the introduction of the process of vulcanization, the application of which leads us into the second half of the nineteenth century. These were eventful days. The porcelain furnace and porcelain inlay were introduced by Jenkins; the use of porcelain teeth upon metal bases reached its height of artistic expression with the continuous gum denture; the substances for partial tooth restoration were undergoing much experimentation and many changes. Silicate cements were being employed. The defects of amalgam were beginning to be recognized. Sir John Tomes, who alone completed the histological data of tooth structures, was one of the leading figures in experimentations with amalgam; cohesive gold took the place of noncohesive; the pneumatic mallet and the rubber dam were introduced, and the dental engine was becoming a reality, although it was not really applied until 1870—a goodly amount of creative and constructive endeavor in a period of little more than three decades.

What was the state of consciousness of the dental practitioner at this time? He was treating caries by mechanically removing the decay, leaving a formless cavity which he attempted to seal with some substance that would resist the stress of mastication, would not interfere with occlusion, would be resistant to the fluids of the mouth, and would be so inserted that the ingress of moisture would be prevented. These requirements were being met by the gold filling. There was no consideration as yet for asepsis. Pasteur at this very period stirred the world with his method of sterilization, which had as yet not been applied. There was no consideration for the formation of a cavity that would meet the requirements of the laws of physics, in being resistant at every point within that cavity to the forces of mastication from all directions, in being retentive, and in being designed to include an area of extension for the prevention of subsequent secondary decay. He was not concerned with constructing his filling to replace anatomically the part of the tooth which had been destroyed, he was not concerned with conforming accurately to the normal relationship with its adjoining member and restoring occlusal balance.

The denture was at this time being applied all over the world. Vulcanite took the place of the metal base for two reasons: first, the process was much simpler, and secondly, it was less expensive. It was, however, being carelessly adapted over ragged roots, encroaching deliberately upon gingiva, producing, together with the destructive effect of the clasp, a decidedly uncomfortable reaction on the patient, which reflected back to the dental practitioner.

And now the shell crown and the fixed bridge were introduced. It is not difficult to understand why the new method found such esteem in the eyes of the laity, why such slogans as "Have a shell crown placed upon your tooth to insure it against further trouble," or, "At last we can put teeth in your mouth that can stay in and feel like your own," were so deceiving. Now it is difficult to understand why the American dentist and American dentistry fell into disrepute with their English friends and with a small voiceless minority in America. A movement frequently receives impetus through some destructive phenomenon. For two decades fixed appliances held uninterrupted sway. American dentistry was the fashion. Its influence spread, especially in France and Germany, and the toll was and still is heavy.

Constructive endeavor was not entirely lost. It continued to exist in England. Sir John Tomes remained the guiding spirit. The silent dissent of the small minority in America found expression at first in criticism and then in a new vigor of creative and constructive effort, which was crystallized in the contribution of Dr. G. V. Black, who imparted the results of his keen observations regarding, particularly, the detailed anatomical formations of teeth and their relationship to each other; and who, with his consideration and application of the physical laws, placed the conception and technic for the cutting of cavities upon a definite scientific basis, that is today universally accepted but by no means universally applied.

The criticism regarding fixed crown and bridgework culminated in an article by Dr. Herman E. S. Chayes (1), from which the following is an excerpt:

"Crown and bridgework has been the worst sort of a makeshift, and if at times its destructive work has been hidden in a period of temporary satisfaction, it has been no less destructive in the end. It has become apparent, upon close study of the dynamics, physics and relations involved that no important point necessary to the success of the appliance, and essential to the physiological wellbeing of the patients and to their hygienic integrity has been considered, except, perhaps, the one requirement of filling the space which is devoid of dental members."

The language is clear and meaningful. It was a condemnation, not only of the one type of fixed crown and bridgework, but of the numerous variations that had sprung up in an effort to get away from the destructive effects of the system. The new objective was hygiene; the appliances were designed to be removed. Their construction, however, was similar in form to the fixed appliance and similar in principle. Their effect was no less destructive. They did not attain their objective of hygiene. In fact, the terrible amount of undue stress exercised against the abutments every time the appliance was removed and placed into position, served to undermine the supporting structures much more rapidly than the fixed appliance. Dr. Chayes's criticism was, however, at the time productive of no further good. Criticism was to be effective in another form which followed immediately after.

In November of the same year, at McGill University, Montreal, Dr. William Hunter delivered his now famous lecture (2). The question of oral infections and their constitutional effects were not new to Dr. Hunter. His keenness of perception had directed him to that conclusion some twenty years prior to his 1910 address; nor was it new in England, where dentists so early had the benefit of Dr. Hunter's investigations. But it was new in America.

"Septic American dentistry" branded the soul of American dentistry. "It is not a matter of teeth and dentistry. It is an all important matter of sepsis and antisepsis that concerns every branch of the medical profession and concerns very closely the public health of the community." And teeth ceased to be a matter of local consideration; they became an integral part of the entire constitution. To minister to the care of teeth meant to minister to the health and life of the human being. That was the purport of Dr. William Hunter's address. His facts were too startling, too convincing—his indictment was complete.

The material effects precipitated by this revelation were interesting. It was as if a bomb had been cast in the midst of the medical and dental professions. Hunter's data were feverishly confirmed. The medical profession began to understand maladies that had hitherto been obscure; a large group of dental practitioners attempted to shift individual responsibilities to legal and educational authorities, who both sanctioned and taught them the methods; another group assumed its responsibilities and set to undo its failures; and the hitherto small voiceless minority continued with its creative and constructive endeavor, now gaining considerable proportions.

Among the memorable achievements of this period was the invention of the casting process, by Dr. William Taggart. For many years Dr. Taggart had been experimenting with the series of steps comprising the casting process. He set definite standards for himself, which he finally executed. The need of a wax that would be homogeneous, plastic, and hard for moulding and that would leave no residue within the mould after dehydration; the need of a refractory compound that would withstand the necessary amount of heat; and the need of an apparatus that would, in one operation, manipulate the fusing of the metals and direct properly a definite pressure to drive the molten metal into the mould; those were his standards. The profession later received the carefully completed process, which is today generally applied in the United States. The casting process made the inlay a reality, which superseded the gold shell crown, and is superseding the gold foil filling. The use of the gold foil filling is becoming rather limited because of the trauma produced by the constant percussion with the mallet against the vital tooth, besides the great length of time needed to introduce the pellets of gold leaf under uncomfortable strain, and because of the difficulty in restoring proper anatomical contour.

Important natural phenomena were at this time observed by Dr. Chayes, namely, that teeth are not fixed entities within their sockets; that they have a definite movement essential to the health and vitality of the tooth and the tissues surrounding it; that this movement takes place during function, and that to fixate any number of teeth into a single mass would prevent the natural movement of those teeth, which would in turn produce a condition of stasis of the surrounding tissues by cutting off the stimulation of the blood supply. One need but cite a simple illustration—the ligating of a number of fingers into a rigid mass. Function is immediately impaired, which in time leads to stasis and subsequent atrophy. It was essential, then, to produce a reconstructive appliance that would have the following features:

1. An appliance that would not inhibit the natural function of the teeth.

2. That would not transmit any undue stress to the abutments, during function.

3. That would not exercise any undue stress against the abutment teeth either when placed into position or when removed from position.

4. That would be hygienically clean.

5. That would not cause any irritation of the gingiva or the underlying tissues.

6. That would not necessitate the promiscuous devitalization of abutment teeth.

Dr. Chayes succeeded in developing a universal method embodying the above mentioned requirements. His system of movable, removable bridgework consists of a series of attachments of various sizes designed to be placed in a buccolingual direction within the normal contour of inlays cast against cavities prepared as prescribed by Black. The thinness of these attachments permits the removal of no more tooth structure than would be necessitated in the preparation of a typical proximal cavity as outlined by Black. The relationship of these attachments inserted within the inlays must be a perfectly parallel relationship. This is accomplished by means of an instrument, known as a parallelometer and designed by Dr. Chayes. The instrument consists of two horizontal planes, one moving upon the other and controlled by an actuating screw. The planes hold a number of clamps with clamp grooves which hold mandrels designed to fit accurately into the attachments. The attachments are thus carried by their mandrels into position within the inlays, the proper distance between the abutments being established by the movement of the actuating screw and the absence of complete strain being checked by the tactile sense of the operator. When the position of the attachments is thus established, they are secured, the instrument and the mandrels are removed, and the attachments soldered to their inlays. These attachments, known as the female portion, have their counterparts, the males, which fit accurately within the jackets. The male parts are attached to the sides of the bridge portion which consists of the number of teeth to be supplied upon a saddle cast against the edentulous tissue. The saddle is designed to cover and include the same amount of tissue area as had been engaged and stimulated by the roots of the natural teeth. The underlying tissues of the saddle receive the stress during mastication, because of a designed give or yield in the relationship between the male and female parts of the attachments.

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Observations on the Existence of Abnormal Physical Conditions as Shown by the Teeth*

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There are teeth to be protected against decay and pyorrhea, as well as teeth to be restored to usefulness from decay and pyorrhea. In other words, "An ounce of prevention is worth a pound of cure."

Since the first dental college was established in Baltimore about 1842, the dental profession has confined its activities to repairing, removing and replacing teeth, with vague and conflicting ideas of preventing these conditions. It is natural that this should be so, for dentistry has not been and is not even now considered a branch of medicine. There are various reasons why the dental profession has been circumscribed in its progress from the medical side, and also why so many of its members still adhere to the belief that all the causes and cures of oral conditions are contained in the mouth.

Dr. Pottenger in the preface of his book, *Symptoms of Visceral Disease*, says, "Though I have devoted myself to the study of diseases of the chest—a socalled specialty—for more than twenty years, experience has led me to see that such a thing as a medical specialty in the accepted sense of the term cannot exist. Diseases cannot be divided into those of this and that organ; for the human body is a unit. One part cannot be diseased without affecting other parts. No organ can be understood except in its relationship to other organs and to the body as a whole."

During the past few years we have learned to our chagrin that a good part of the repairing and replacing has been septically performed, with the result that the medical men have not been backward in calling our attention to the systemic conditions that have resulted.

We now wish to call the attention of the medical profession to the fact that dental decay and pyorrhea accompany the lack of coordinate function of the body as a whole and that a small part is of local origin, and it is up to the physicians to cooperate with the dental profession for its control.

There are two sides to dentistry—the mechanical and the medical. As dentistry originally was entirely mechanical, development has been the greatest along this line, while we have been careful not to encroach on the medical for two reasons. First, we have been too busy developing and selling our mechanics. Second, we are not a branch of medicine, and zealously have been taught and have believed that everything connected with our profession was contained in the limited area of the mouth.

As our study in dentistry penetrates deeper into the problems of oral conditions the fact stands out with ever increasing emphasis that the human body is a unit and incapable of real division into specialties. The preeminent man in dentistry of the future will not be the scientific laboratory worker, or the exodontist, who is most skillful in removing teeth, or the orthodontist who can perform wonders in regulating, or the specialist in periclasia who can most skillfully remove all deposits from the teeth, or the prosthetic specialist, who can rival nature in the beauty and usefulness of his restorations, but the man who recognizes the fact that the truths derived from all these sources of study and investigation with the observations of the systemic conditions that cause or accompany the necessity for the specialists in these branches; in other words, the man who studies and interprets the human body as a whole in relation to dentistry.

The specialist should be one who regards his field of study in its intimate relationship to the body as a whole. The dentists of fifty years ago were good mechanics and good clinical observers as far as the mouth was concerned, but they were not armed with many of the scientific facts which form the basis of modern dentistry. Consequently it was dentistry founded upon mechanical restorations of the teeth with little clinical observation of oral conditions and practically none in their relation to the body as a whole. Is this to be wondered at, for the dentist, jealous of his profession, was taught little of general medicine and did not consider that he needed it. Some physicians did not consider that the teeth were important and in turn were not sufficiently interested to even learn their names.

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*Read before a joint meeting of the Syracuse Academy of Medicine and the Syracuse Dental Society, May 7, 1922.

The belief that the cure for dental decay and pyorrhea is entirely contained in the oral cavity is still held by many of the profession. Most men change their opinions with difficulty, even though they have never examined the reasonableness of these opinions. If it is painful for a man to leave the home where he has spent most of his life, it must be still more painful to break with his old education. The status of all business, profession, or science depends upon a mass of established and accepted facts, which may be true or not, but as far as their influence is concerned, they dominate it. An advancement is only made as increased knowledge shows that some of these socalled facts are errors.

We have endeavored to evolve dentistry through the laboratory of scientific research, in dental pathology, bacteriology and histology, so that today we are looking almost entirely to the development of these specialties to answer our problem of oral conditions, while we have ignored the clinical observation of the mouth in relation to the body as a whole. While fundamentally there can be no antagonism between the scientific worker and clinical observations, they must be brought together for the building of a unified dentistry of the future. The one outstanding need of modern dentistry is accurate clinical observations and interpretation. I do not mean to underrate all the laboratory has given us or be ungrateful for it, but clinical observations have not kept pace with the laboratory work for the reason that the dentist did not think he was a branch of medicine and that he was only a "tooth carpenter" and for that reason he had no right to encroach upon the territory of the physician to do any clinical observation of the teeth in relation to the system as a whole.

Dentistry has developed unevenly. Scientific laboratory work has been an inviting field, for there have been so many lines of investigation that could be done without the inconvenience of the examination of numerous patients, while the dentist in general practice who comes into contact with patients has not the time for such examinations and frequently has not the knowledge or the inclination to make accurate clinical observations.

To correlate properly all the facts that have been given us by scientific workers and the clinical observations of the past and present, we must link these two together with practicality and common sense, and thus eradicate errors and false theories that may creep in. Dentists must be familiar with all the laboratory facts and the method of obtaining them. They must cultivate the same accuracy of observation as the laboratory worker. The patient is the subject of the clinical observation with all the departures from normal function and all the abnormal tissues, secretions and excretions, found upon examination.

There can be no doubt that great inaccuracies are bound to occur in data obtained through clinical observations of patients. Much of this inaccuracy arises from our lack of knowledge, partly to inaccurate observations, and somewhat to misinformation furnished by patients.

If we compare clinical observations and interpretations with our scientific data, we will find there is not so much difference as one would expect, especially if they are joined with a little common sense.

As an illustration I have a patient who is a professor, and I suggested to him that I would like some way of preventing dust from collecting on top of my cabinet. He replied that that certainly could be done and he would help me. So the next day he appeared with a piece of glass six inches square which he placed on top of the cabinet for the purpose of collecting dust. He then measured the distance above the cabinet to get the cubic amount of air over it. He then took a sample of some of the air containing the dust back to his laboratory. He informed me a few days later of the chemical composition of the dust he had collected, how long it took a certain amount of dust to fall one foot, how long it would take to collect a centimetre of dust. He had also investigated the neighborhood and found that this dust was produced by automobiles in the street, the smoke from nearby chimneys and some kicked up by the dog in the next yard. He suggested that we have smoke consumers or screens put on the chimneys, the dog sent to the country and automobiles kept off the street. If these suggestions were complied with, he felt sure that the amount of dust would be appreciably lessened. I asked him what he thought would happen if I closed the window over my cabinet. Wouldn't that be the common sense way of eliminating most of that dust? He might say, "I never thought of that."

The scientific theory of medicine as put forth in the medical books and practised in 1790 was—if a patient is ill, bleed once. If not better, bleed twice. If still no better, bleed three times, for it is better to live weak than to die strong.

Today with our more advanced knowledge we smile at this theory, and yet with all of our advanced science we may be as far from the correct treatment of some conditions as they were in 1790, for we have not as yet reached the point where the ultimate goal can be realized, but a sure way of advancing toward the ideal is to use practical methods in the application of science.

Too many physicians do not regard the dentist as other than a local mechanical specialist, and many dentists themselves regard the process of dentistry as merely a mechanical adjustment. They do not pay enough attention to conditions at their inception, and are prone to overlook minor ailments and adjustments which if not recognized may become a serious condition. They do not realize that the conscientious observing dentist may be able to develop from his experience valuable diagnostic observations.

There has been in the minds of both laity and the professions a tendency to concentrate on the ailment or defect of one or another particular manifestation and overlook the working of the machinery as a whole, in other words, to quote a medical editorial "an overdone specialism."

Referring to our first paragraph that there are teeth to be protected from decay and pyorrhea as well as to be restored to usefulness from decay and pyorrhea, for the past few years I have been correlating clinical data based on scientific facts. There is no doubt there is a certain amount of error in the interpretation of these observations, but if I can stimulate other members of the profession to work along similar lines there is no doubt that the time will come when we shall be able to control dental decay and pyorrhea as well as the physician controls understandable diseases. There can be no doubt to the careful observer that pyorrhea and caries accompany systemic conditions.

The resistance or tone of the gums or investment tissues of the teeth and the attributes of the protecting secretion in which the teeth are bathed must necessarily be dependent upon the systemic conditions, for they do not derive their blood and nerve supply from the circumscribed area of the oral cavity, but from the body as a whole.

Dr. Carrel in his experiments on the cells of the chicken embryo was able to keep alive for many years undifferentiated tissue cells, by protecting them from infection, poison and trauma, and these cells when properly nourished and protected apparently have an indefinite lease of life.

None of the organs and cells of the body is as perfectly protected and nourished as those in Dr. Carrel's experiments. Consequently we do not have an indefinite lease of life, for we are not carefully nourished and are open to all kinds of infections, poisons and trauma. These infections, poisons and trauma would have comparatively little effect if we had the proper resistance and tone to our bodies, the major part of which is due to heredity, toxic substances, diet and endocrine secretions.

So far as the individual is concerned, heredity may profoundly influence the quality of his tissues, his organs and his underlying resistance. Outside of syphilis, there are hardly any diseases that are hereditary, but a weakness in any of our organic functions may be hereditary, and those weaknesses may lead the same disease to be produced as in the parent, but the disease itself is not passed on by the parent.

A toxic substance is any substance taken into the organism or so changed or manufactured in the organism that it produces an accelerating or inhibiting effect upon any cell or group of cells causing impairment of function. There are three ways in which the body becomes surcharged with substances it cannot use. First, by the mouth in the form of excess or unusable food products. Second, by being manufactured in the body by microorganisms. Third, by the lack of elimination of the waste products of cell metabolism. If these waste and useless materials which are toxic substances are not entirely eliminated, then they must of necessity remain in the body and will have their influence upon the different tissues in proportion as they increase, affecting the secretions as well as lowering tissue resistance.

Emerson said, "Human beings are as lazy as they dare to be." As human beings are only an aggregation of cells, it is obvious that the cells would have the same characteristic of being as lazy as they dare to be, which might be another reason for lack of sufficient elimination of our waste products.

In my discussion of types and textures interpreted in terms of endocrinology or glands of internal secretion, I realize that I am treading upon rather new and controversial scientific ground. I am, therefore, in my observations giving the average consensus of several authors, leaving those who disagree to fight it out with these writers themselves. Coming back to common sense again, these observations work out in the case of the teeth and their ailments and care, and that is my particular interest and point of view.

In the endocrines there are three more prominent types, the thyroid, the pituitary and the adrenal. These vary according to the influence of the other glands. The secretions of all the glands vary from undersecretion to oversecretion.

The thyroid facilitates energy productions. It also has an antitoxic function, its power being to increase the resistance to poisons and bacteria. The feeding of meat to an animal deprived of thyroid shortens its life, so it must assist in the prevention of autointoxication. The thyroid type has bright eyes, clean, hypersensitive teeth, pearly, small and regular, moist skin, tendency to heart, intestinal and nervous diseases. Subthyroid persons are more susceptible to alcohol, morphine, cocaine and novocaine than normal or hyperthyroid. The subthyroid person is stupid and they have unclean mouths and caries of the teeth.

The pituitary contains two glands in one, the anterior and the posterior. Most investigators agree that the anterior lobe of this gland has the greatest influence on the growth of bone, the connective, and supporting tissues, while the posterior part of the gland seems to have control over the tone of tissues, such as the involuntary muscle fibres of the intestines and bloodvessels. It will increase the blood pressure and the flow of urine when injected. It assists in the rate of metabolism or tissue combustion, which is the use of energy. An excess of the secretion of the anterior lobe before puberty results in the elongation of bone. The teeth are large, irregular, square, with prominent centrals. The pituitary predominance seems to control the size of the centrals. The hyperpituitary person has square protruding jaws, high nose and well marked cheek bones. There is a tendency to periodical diseases. The teeth are long and square with a marked separation of the anteriors, little or no caries. In an undersecretion of the anterior lobe the body is small and the patient usually fat and lazy, teeth usually oval, small, carious and crowded. A subsecretion of the posterior lobe usually allows pyorrhea to become existent from lack of stimulation of tissue tone.

The cortex of the adrenal is the outside or bark and is supposed to control the growth of the brain cells, their number and complexity. Besides its action on the sex and brain cells it has an action on the pigments of the skin which increases or decreases its sensitiveness to light, so that the color of the skin, whether blond or brunette, is looked upon as being controlled by the cortex of the adrenal glands. The secretion of the medulla is adrenin, which is supposed to control combat and fear. In the case of fear, which underlies a desire to fight, a small quantity of reserve adrenin is released into the blood, which in its turn takes the blood away from the intestines, liver, spleen, skin, and other organs, and sends it to the muscles. It also liberates sugar from the liver, as the cells can get energy rapidly from sugar. Adrenin is also antagonistic to fatigue.

Adrenal excess is usually accompanied by high blood pressure and a great capacity for work without the usual fatigue. The teeth are well developed, tending to the yellowish color, with premature eruption. In the subadrenal types, the dentition is delayed. The size of the cuspids seems to be proportionate to the adrenal activity. Long, sharply pointed cuspids are indications of well functioning adrenals. The adrenal person is hairy, dark, has a tendency to diphtheria and hernia. The face is usually dark, irregular and hairy.

These are three principal or master types. The gonads, pineal, parathyroids, thymus, mammary, spleen and pancreas all have their effects on the teeth. Decayed teeth will usually accompany a condition of undersecretion.

The thymus is thought to affect the nutrition of the body during childhood, for the teeth are youthful, thin and translucent, crescent or scalloped at the biting edge and of a milky white color, and will decay if the secretion is sufficiently subnormal.

The gonads also have an internal secretion. The lateral incisors are nearly always distorted or irregular when these glands are inferior. When the laterals are missing in the male, the glands are weak. In the female the ovaries are usually affected. A hypersection will accompany pyorrhea.

The parathyroids have control over the lime metabolism, for where there is a lack of secretion the teeth fail to develop properly, particularly the enamel, for which lime is essential.

The endocrine secretions have an underlying influence in the growth of every person, the size of the skeleton, the proportion of the size of his arms and his legs, whether he is tall, short, thin or fat. In the skull, whether the forehead is to be broad or narrow, the eyes close together or wide apart, the size of the nose, jaw and the peculiarities of the teeth, the skin, its color and quality, and the mucous membranes all show this influence.

DIET.

Diet has as much to do with caries and pyorrhea as any other factor. A patient living on a meat diet, with breads high in starch and carbon, few or no vegetables, especially no raw ones, continued over a long period, will certainly have scurvy, pyorrhea, and decayed teeth. Such patients will naturally improve on a course of fresh foods, onions particularly, with little bread and no salt, while drinking plenty of lime juice and water, with plenty of oranges, apples and other fresh fruits.

Foods in themselves do not give us strength nor vitality. If they did the more we ate the longer we would live and the stronger we should be. Our strength and vitality come from our cells. They manufacture it from obtaining proper foods, and if we do not give them proper foods, they not only cannot manufacture strength and vitality, but they have to use a large part of the strength and vitality they have in eliminating useless and excess food material.

A balanced ration is required by the normal body, this balanced ration being composed of a number of foods. Very few of us ever get it, for the reason the people who prepare our foods either do not know how to prepare balanced rations, or else we do not know or care enough to ask for it, as long as we can get the foods that tickle our palates.

A great many of our troubles are due to some form of indigestion, which may have little or nothing to do with the stomach itself. The only true digestion is cell digestion. The only purpose of the stomach is its action in doing its part in preparing the foods that they may be converted into fluids and be absorbed by the blood, which carries these prepared foods to the cells in different parts of the body. As supplies of blood pass around, the cells take what they need, if they can get it. One source of neutral troubles is that the cells—like the body as a whole—are fatalistic in instinct. If they cannot get what they want, they will do the best they can—take the next best thing that offers, although the same next best thing may be the slow poison of uneliminated waste products of cell metabolism or other material that may have a toxic effect.

In dental caries the teeth must be necessarily protected by the secretions which continually bathe them. As has been written and discussed before, the saliva from the parotid, sublingual and submaxillary glands is not this secretion, as it varies materially in the quantity and quality of its component parts. It is obviously not possible to have a protecting function on account of its variability. The secretions of the mucous glands of the tongue, cheeks and lips are the protector of the teeth, and these secretions accompany the variations of the other secretions of the digestive tract, and the variation in these secretions may be produced the same as in pyorrhea by heredity, toxic material, diet and the endocrine secretions.

The color of the tongue in adult life is a reddish pink. A bright red glistening tongue is usually a symptom of disease. When the tongue is covered with a thick yellowish coat and a bad taste in the mouth, the mucous glands are not producing their proper secretion and this is an indication of derangement of the digestive organs. The whole alimentary mucous membranes are in close physiological connection. Any disorder of the stomach that will produce a furred tongue usually indicates something is wrong with some of the other organs of the digestive tract. A deranged mucous secretion is not responsible for all the decay that takes place. Traumatism, incomplete or imperfect calcification, and incorrect relation of the teeth also permit decay.

In dental decay the relation of the different parts of the digestive tract and the areas of the mouth are about the same as in pyorrhea. In pyorrhea it is the lack of the eliminative function. In caries it is the area of deranged secretions that accompany dental decay. This derangement must remain over a sufficient period of time to allow decay to take place.

We should abandon forever the idea that the practice of dentistry is merely mechanical and not dependent on the pathological and physiological conditions of the body as a whole. To learn to use instruments deftly and skillfully to remove deposits from the teeth is essential from the mechanical viewpoint, but this is not enough, for the dentist of today must be something more than a mechanic and this can only be accomplished by a closer observation and study of systemic disturbances that accompany oral conditions and the localization of oral diseases.

241 West Seventy-first Street.

Extensive Involvement of the Ocular Muscles Due to Focal Infection of the Teeth*

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Focal infection of the teeth, as the direct or predisposing cause of disease of the various structures of the eye, has become a matter of increasing study. Its effect upon the external ocular muscles has received little attention and, in the few cases reported, single rather than multiple muscles were involved. It is my purpose to present for your consideration a case in which focal infection of the teeth appears to have been the sole cause, and in which there has been such extensive involvement of the external ocular muscles, that I believe it to be unique and perhaps of interest.

May I pause for a moment to remind you it is but a short time since Sir William Lang (1) had his attention called to a case under treatment for a general medical condition in which a keratitis seemed to be a separate entity, where the patient quickly recovered with coincident disappearance of the corneal inflammation when an infective pyorrhea alveolaris was discovered and corrected.

His study and report of a series of ten thousand cases of disease of the eye and its appendages due to focal infection followed, wherein our attention was called to the fact that focal infection wherever located, but pyorrhea alveolaris especially, caused inflammation of every part of the eye, the uveal tract being involved in about fifty-three per cent. of all cases.

Since then, valuable papers have been contributed by Benedict (2), Bedell (3), Stallings (4), and a host of other observers, so that it is now recognized that many types of disease of the eye are caused, either directly or indirectly, by diseased teeth or their surrounding structures; that these may be of any degree of severity and that cure is often effected, even in those of a chronic or recurrent type, when the infected teeth are removed or the pyorrheal condition is corrected; that ocular changes resulting from dental lesions may be divided into two groups —organic and functional—and the organic may be subdivided into deep and superficial; that the histological variations in the structures of the eye determine whether they are involved by the bacteria *per se*, by the toxins of the bacteria, or by both; that uncorrected eye strain plays an important part in favoring localization in the eye of infection circulating in the blood. It is equally true that an eye after operation has lowered resistance which in the same way plays an important part in favoring localization of infection; that there is often a direct relationship between the eye affected and the location of the infected teeth responsible for the condition. This is true of the functional cases especially. Here the infected teeth are most often on the same side of the jaw as the affected eye and chiefly limited to the upper jaw; that the process of transmission of the infection from the teeth to the eye is in almost all cases problematical. Three pathways are recognized however:

1. Direct extension through bone. The tooth socket becomes the seat of an infection which destroys the bone of the upper jaw and, by direct extension through contiguous structures, reaches the walls of the orbit and sets up an orbital cellulitis which extends to the tissues of the eye itself.
2. Direct extension of the infection along the periosteum of the malar bone to the orbit.
3. Transference of the microorganisms or their toxins from the foci about the teeth to the eye by the blood stream.

In addition, may I particularly call your attention to the fact, there may be direct transference of the microorganisms from the teeth to the eye by the patient himself. This is perhaps more common than we think, especially in postoperative cases, and is to be guarded against. Rubbing the eye because it itches with a finger moistened with saliva has caused the loss of the eye, and, where the patient is instructed to carry out the treatment for himself, contaminated fingers are easily responsible for contaminated compresses and these in turn for an infected eye.

A diseased eye caused by focal infection of the teeth is at times but little influenced by extraction of the offending teeth. Infective material may be left behind in the sockets, perhaps with necrotic bone, or there may be secondary foci set up in other structures, as the tonsils, sinuses or gastrointestinal tract. These are just as dangerous as the infected teeth. Therefore each case should be referred to a dentist who is skilled in his work and the importance of thorough supervision impressed upon both dentist and patient. Too often the dentist is satisfied to pronounce the teeth negative because of external appearances and without an x ray being taken, or he is content with simple extraction of the teeth, paying no attention to what may be left behind and hence all infective material may not be removed. There is an added danger in stopping the flow of blood from the socket too soon. Nature is washing away the infection. It is sound practice to pack the socket that healing may occur from the bottom and thus avoid too early closing of the wound by sealing the top with retention.

We are warned against too vigorous dental treatment, as disastrous eye conditions have followed, especially in elderly people. Let us remember dental treatment is never to be carelessly done with excessive traumatism, but, on the other hand, it is possible that it is not extensive enough to insure removal of all infective matter and, in consequence of the trauma induced, this readily gains entrance to the blood through the portals thus opened up.

May I emphasize the fact that often an eye is operated upon too soon after the dental treatment attempts removal of infection. This, as has just been stated, is often imperfectly done. Allow sufficient time to elapse in every case that healing may be fully established, all secondary foci sought for and if found corrected, for an eye after operation is one of lowered resistance to any infection which may be circulating in the blood.

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*Read before the Section in Ophthalmology of the College of Physicians of Philadelphia, February 16, 1922.

Case I.—Mr. W. K., aged sixty-five years, presented himself January 17, 1922, for examination, complaining of diplopia. His previous medical history was negative. The patient smoked ten to twelve cigars a day. The patient had felt somewhat dizzy at times for the past week. Last night, while watching a moving picture, he was seized with sudden vertigo, when he saw everything double. Closing one eye, sight seemed to him unaffected in either eye. but with both open he could hardly walk because of the confusion which followed. There was no pain or other subjective symptom and no history of trauma.

Examination—vision O.D. 15/50? and with correction 15/20?? O.S. 15/70? and with correction 15/30+.

The eyes were somewhat staring with widening of left palpebral fissure and left eye turned somewhat downward and inward. Conjunctiva and cornea were negative in both eyes. The pupils were equal; responded promptly to light, but right more quickly than left, and both respond quickly and evenly to accommodation. Consensual reflex was normal. Media was clear and fundus negative in both eyes.

Ocular movements: O.D.: No movement up or down in vertical axis; slight limitation to both abduction and adduction in horizontal meridian; limitation moving eye up and out; no down and out movement at all; limitation up and in with greater limitation down and in. O.S.: No movement up and but slight movement down in vertical axis; some limitation of abduction and slight limitation of adduction in horizontal axis; no movement of eye up and in; some limitation down and in; more marked limitation up and out as well as down and out.

With point of fixation directly in front of patient and at a distance of 10′ there is diplopia due to both exophoria and right hyperphoria. On approaching the patient the exophoria disappeared at one metre, and the hyperphoria was not as pronounced and at a distance of fourteen inches from the face this also disappeared, when but one object was seen. Point of fixation held at one metre from face; in right horizontal field the diplopia disappeared but in left horizontal field was more marked than when the object was in front of the face; in right upper field there was a wide separation of the images and in right lower field there was diplopia but images are not as widely separated as in right upper field; in left upper field there was still wider separation of the images and in left lower field the diplopia disappeared with but one image. In all of these the images were parallel with no demonstrable tilting and the hyperphoria much greater than the exophoria.

Subsequent history of this case was as follows: Wassermann reaction and uranalysis negative. Blood pressure was 100 mm. systolic and 60 mm. diastolic. Physical examination showed nothing abnormal. Dental x ray showed a marked absorption of the alveolar processes about the roots of all the remaining teeth with pyorrhea and pockets containing pus.

The patient was placed upon eliminative treatment and promptly referred to a dentist who immediately cleared out all suspected foci of infection. Twenty-four hours later he was much improved and next day the diplopia had disappeared but he complained of some slight blurring of vision. The muscles had apparently recovered fully. On January 25th at fifteen feet there was present 6° of esophoria with 3° of right hyperphoria, and on February 9th, 3½° of esophoria and 1° of hyperphoria. This has remained constant since.

From simple movements of the eyes it would appear that all the muscles of each eye were affected to a varying degree, with a complete paralysis of the superior recti in both eyes and the inferior rectus of the right eye, associated with almost complete paralysis of the superior obliques in both eyes.

From an analysis of the conjugate movements, however, I believe that this man had complete paralysis of the left superior rectus and right superior oblique, with marked weakness of the right superior rectus, left internal rectus, both inferior obliques and left superior oblique, associated with slight impairment in the action of the right internal rectus and both external recti, the latter two presenting the least disturbance.

That multiple muscles may be involved is borne out by the history just recited and that more than one muscle may be affected is substantiated by the following case:

Case II.—Mrs. C. H., aged twenty years, was carefully refracted about one year ago and glasses given. Repeated examinations of the muscles at that time revealed 6° of exophoria and 1° of right hyperphoria for distance, which did not vary but was of equal degree in each of the several examinations made, with orthophoria for near. On December 15, 1921, she reported to me complaining of vertigo and occipital headaches with eye fatigue, especially on near effort. At this time there was a tendency to carry head turned slightly toward the right shoulder. Vision in each eye was 15/12???.

Examination of each eye was negative except that in the left eye there were two small, pinhead spots of pigment deposit in the retina to nasal side and about one disc diameter from the nerve head.

There was no apparent increase in the divergence of the eyes and no demonstrable interference with the action of the muscles when the point of fixation was held at fifteen inches from the face, but a tendency to latent divergence had developed. There had always been good convergence with orthophoria for near; now convergence was maintained by slight effort. With object at a distance, however, there was present a tendency, with no apparent preference shown, for one or the other eye to fix while its fellow turned out. The exophoria was now increased to 9° for distance and 15° for near, with no hyperphoria.

General condition of health was good, physical examination negative, as were also the laboratory examinations. Blood pressure was 140 mm. systolic and 76 mm. diastolic. Teeth had been under observation by two dentists who reported them to be in good condition. X ray was requested of all the teeth. Throat and sinuses were negative.

Her symptoms progressively grew worse, nausea was added, and observation at frequent intervals gave a progressive increase in the exophoria so that on December 23rd there was 11° of exophoria and 1° of right hyperphoria for distance, and 20° of exophoria and 1° of right hyperphoria for near. There was now present 10° of manifest divergence, with marked latent divergence and a steadily increasing preference for O.S. to fix.

The patient did not have the x ray made, but now a right lower molar became painful, followed by an abscess and discharge of pus through the gum. This tooth was merely treated until December 29th, when there was 23° of exophoria for near and with left eye fixing there was about 30° of divergence of O.D. The offending tooth was removed. Two days later there was but 9° of exophoria for distance and 15° for near.

Her condition then slowly became better and on January 24th she had 8° for distance and 6° for near, with no hyperphoria. There was now no apparent limitation of the muscle movements of each eye, convergence was good, with much less latent divergence.

This, then, was a case where a muscle imbalance was made decidedly and progressively worse by an infected tooth. Here both internal recti were involved, but the right to a greater extent than the left.

Finally, to impress upon you the importance in insisting in every suspicious case upon an x ray being taken, irrespective of the dental examination and report that there is nothing wrong with the teeth, may I cite the following case as typical of what is frequently encountered?

Case III.—Mr. L. G., aged thirty-six years, presented himself complaining of the right eye feeling heavy and tired, and for the past week "a film" over his eye. He had never had as good sight in his right eye as in the left, however.

Vision—O.D. 15/70, O.S. 15/10? The external appearance was negative for both eyes. The cornea were clear, pupils equal and responded promptly to light and accommodation. O.D. Large and small floating vitreous opacities. Good red reflex, but no view of fundus obtained. O.S. Media clear. Disc margin blurred, with slight blurring of retina which had a granular appearance on the temporal side toward the macula.

General physical condition showed no demonstrable lesion and blood and urine were negative. Dental report was negative but no x ray was taken.

Condition remained much the same for three months. There was improvement but not a satisfactory one until an x ray was insisted upon, the report of which is as follows:

"There is a pyorrhea pocket, and some deposit on the anterior surface of the left upper second molar. There are apical abscesses at the roots of the upper central incisors. There is a pericementitis about the lingual root of the right upper first molar. There is a large abscess with necrotic bone about the roots of the left lower second molar and the left lower first molar. The left lower first molar has a remarkable deposit of calcareous material on the roots, of what is usually spoken of as exostosis. The lower left lateral incisor apparently has two roots, and both show abscesses."

Appropriate dental treatment followed, when marked improvement was obtained, so that a +1.50 cyl. ax. 60° gave 15/20 vision.

The patient still has vitreous opacities and a fluid vitreous which in all probability is a fixed entity.

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The Prevalence of Oral Disease and Its Insidious Effect Upon General Health*

By BERTRAM B. MACHAT, D. D. S.,
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There are so many angles to the study and treatment of disease that we frequently overlook or leave the most obvious for last. It is but a few years ago that I vainly searched in textbooks for enlightenment on the teeth as avenues of infection; today, no treatise on pathology, bacteriology and related subjects would be complete without a comprehensive chapter on the various infective diseases of teeth and contiguous tissues and their immediate and potent effect in the production of systemic infection.

In this paper I intend to point out that the mouth, the gateway to the human body, hence the most obvious, is without a parallel as a portal of disease. The mouth is not only a mechanicochemical laboratory but also because of its unique relation to and position in the body, is subjected to natural, willful and accidental stress, thus rendering the parts within the oral cavity most vulnerable. While the soft tissues when injured are, like all other tissues in the body, susceptible to repair, this does not hold good of the teeth.

Teeth are end organs, and even though highly resistant to accidental damage and natural deleterious influences, nevertheless succumb; for, unlike any other tissue in the body the tooth is unable to successfully defend itself and is impotent in autogenous repair; hence, as we shall further explain, it becomes a primary factor of disease par excellence. This is especially true of the tooth whose formative organ, i. e., the pulp, is either diseased, devitalized or extirpated. Even where a healthy pericementum (or as it is also known the peridental membrane) obtains, such a tooth as I shall now point out is at least potentially pathogenic.

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The tooth which is intrinsically devoid of circulation (pulpless) while wholly incapable of defence, offers nevertheless ample pabulum in the form of decomposed organic tissues within its canals and canaliculi and other favorable conditions as to render such a tooth a perfect incubator. And since the natural crown is usually artificially sealed, drainage of disease products from the root occurs by way of the apex into a richly vascular subdental tissue whence communication with distant parts is readily established by the lymphagenous or hemic routes. It will be seen, therefore, that unlike any other part, the dental root canal presents an unrelenting focus, and even though the infection may be of low grade (generally, but not always) given sufficient time it will break down the bodily defences and ultimately defeat the host. In addition, we must consider the multiplicity of chances of infection from these sources as may be expressed in the number of root canals which in the normal dental complement is variably about sixty; so also the common almost universal occurrence of one or more such apicodental foci of infection in the life time of any person, and its ultimate cumulative effect.

Notwithstanding the fact that considerable literature has appeared of late pointing to the peridentally healthy pulpless tooth as harmless, we cannot share in such claims, for our own investigations have proved the contrary to be true. Intrinsically devital teeth, regardless of root filling efficiency, or of apicopericementai conditions have in our hands, on incubation, almost invariably yielded positive cultures. Such teeth (commonly known as pulpless or devital teeth) practically always yield streptococci in pure culture and but rarely give any symptoms by means of which the patient or physician may become alarmed. This may further be substantiated by the comparative infrequency of the acute apicodental exacerbation which is generally held as a manifestation of high resistance and probable limitation of the infection. Even here, when chronicity is established, until the pathological tissue is removed, recurrence of infection will supervene.

Yet, in the face of this extraordinary condition we speak of phagocytosis, inhibition and immunization. We can conceive of a focus elsewhere in the body being arrested or obliterated; that is, where body defences may be overwhelmingly organized to combat bacterial invasion, but the intradental focus is unique, since at no time can these body defences destroy the prolific last one streptococcus which inhabits the deep recesses of the dental canaliculi. So, to repeat, is it not clear that the dental focus as an initiatory source because of its guerilla warfare is incomparable in the body? Even its running mate, the tonsil, when infected, cannot be proved to be causative or resultant. In passing, it should be stated that unimpaired teeth are not infected by diseased tonsils; on the other hand we have encountered many tonsillar affections which have cleared up after the removal of diseased maxillodental foci. Therefore, it appears that when in search for the etiology of any general complaint many possibilities may present themselves as logical, but none will be found more concrete as a primary factor than the anomalous or infected tooth. For example, let us assume that the findings of an unbalanced blood chemistry, an engorged sinus mucosa, or a disturbed endocrine are substantiated, still their correction would be but temporary if the causal agent, the infected tooth, remained in situ. Let us assume also, that the aforesaid disorders exist coincident with a positive Neisserian or Wassermann test, would there be any speculation as to the proper course of procedure? Certainly antispecific treatment would be promptly ordered; why not pursue the same course where dental sepsis is found?

Dr. John E. Talbot, in an article entitled Focal Infection and Its Relation to Obstetrics, states: "So far as recent teaching has gone, Spirochæta pallida has been granted the exclusive privilege of passing the villous membrane and infecting the fetus." And further on he states: "Why should the spirochæte enjoy the exclusive privilege? There is evidence accumulating that this is not so, however, and once it is proved that other bacteria pass the villous membrane then a focus of infection capable of throwing bacteria into the maternal blood stream becomes a danger and a menace to the life and welfare of the fetus."

Referring to the common occurrence of mouth infection, Dr. E. Irons (1) asserts that "Infections of the mouth stand first in point of frequency as a cause of metastatic infection."

Talbot (2) states that nearly every baby, in which in his experience hemorrhage has developed, when newly born, the condition has come from a mother in whom he has been able to demonstrate foci of infection in teeth, and that a high percentage of such mothers have shown some signs of toxemia during their pregnancy."

Moorhead (3), in a study of 150 cases of systemic disease, found chronic dental abscess in eighty-nine per cent., pyorrhea in seventy-six per cent., alveolar abscess in sixty-nine per cent.

In the consideration of mouth pathology the average physician lays stress upon the gravity of pyorrhea alveolaris; still without minimizing the seriousness of metastatic invasion from this field, that is, the extradental focus, pyorrhea alveolaris when compared with closed dentofocal infection, is benign.

In the March, 1920, number of the *Dental Cosmos* I published the result of his bacteriological investigation of one thousand pulpless teeth. In this group are included only the symptomless type in which, to a great extent, is the pulpless tooth, concerning which there has been much discussion of late. The findings are as follows:

a. Mixed coccus infection is usually found in connection with cases of extensive apical involvement.

b. Devitalized teeth with negative radiographic findings, commonly yielded a pure streptococcus.

c. When specimens from several teeth of our patients were cultured, similar morphological grouping was found in all.

d. The same organism was recovered from the blood, in a few instances.

e. The presence of rods and spirilla on the microscopic slide is taken evidence of contamination, such findings having been rejected.

Richards (4), in the study of 104 cases of arthritis, found: in blood cultures, Streptococcus viridans in fourteen cases. Foci of Streptococcus viridans were found in teeth, fifty cases; tonsils, forty cases, and antrum, four cases.

It has been my observation in the oral treatment of patients who presented refractory general systemic complaints, where complete or drastic maxillodental surgery was performed, the results were highly gratifying. This was especially illuminating to me in instances where my patients were physicians of considerable experience and whose personal recoveries left little in point of speculation as to cause and effect. Some years ago I was called upon to treat a physician whose general poor health was aggravated by frequent spells of vertigo. His own experience as a consultant and the advice of the best medical talent attested to the fact that focal infection would be found the underlying cause. Several weeks after the removal of diseased teeth the doctor wrote me of his complete recovery.

A similar case presented itself several months ago. When I first saw this doctor he was in a very feeble condition. His mouth presented an extensive pyorrhea alveolaris in addition to many apically diseased teeth. There was considerable discussion concerning the safety of surgical interference; his physician finally decided that his only hope was in the clearing of the mouth from disease. Shortly after the removal of the first group of teeth his recovery was prompt.

It is not feasible here to go on with the citation of similar cases for this would make a very large volume, but generally speaking my study of over three thousand medicodental cases, now covering a period of nearly ten years, fully justifies the constant plea—investigate the mouth first, not last.

In the short time that the danger of mouth infection has become popularly known, much has been done and badly done. Like all new enterprises it has not yet found its proper balance. We hear of those who go to extremes in either conserving or removing teeth. Undoubtedly this is the result of misinformation and is largely due to lack of collaborative work. The medical man instead of looking to the well trained dentist for advice, takes matters in his own hands, refers the patients to a radiologist and then governs himself according to the x ray report in ordering teeth removed. Likewise the dentist who is not fully informed of the refractory conditions of the patient's malady is likely to take a more optimistic view, with the result that either harmless teeth are removed or dental tragedies are retained. Under these conditions recoveries are few and disappointments are many. Another militating factor is the manner in which teeth are removed. Unless complete eradication of maxillodental foci is resorted to, recovery is but temporary, relapse follows some months after extraction and the dental phase is apt to be dismissed as misguided.

These disappointments are probably responsible for the new hysteria which of late is appearing in our literature, "on the fallacies of the theories and practice of mouth pathology."

Many in our respective fields, who have given this question but a limited test, are relieving themselves of much rhetoric which in effect disparages and grossly minimizes the potency of mouth pathology. In view of the foregoing let it be said that herein, in these ambiguous and unproved statements which tend to befog the true issue, thus prejudicing the general practitioner against the removal of teeth in properly selected cases—lies the real danger; for the very progress that has been made in a field so tangible and productive of cures is thus being impaired.

It is clear that the time is ripe and the circumstances demand that men of both professions collaborate and coordinate their work more zealously in the practice of this borderline phase rather than in the indulgence of literary brilliancy.

In my own experience, wherein the physician's cooperation is part, we find that over sixty per cent. of our patients have improved or have been completely restored to health. Are they all accidental? Over eighty per cent. of a group of one thousand five hundred patients with two or more long standing sealed pulpless teeth, presented a blood pressure from twenty-five to thirty-three per cent. below normal, with a Talquist reading of from ten to thirty-five per cent. below par.

Space does not permit detailed statements of the foregoing, but is there any method in the treatment of disease that yields a higher percentage of success?

Or, are we again going to advance the hackneyed argument, i. e., the existence of many other possibilities in the production of these remarkable recoveries or circulatory conditions? In this paper I do not indulge in speculative statements or in farfetched theories. Nearly every one of the patients treated by me has had extensive, expensive, and exhaustive medical attention. That is why these patients present unusual interest.

In point of example I was called in to see a girl nineteen years of age in a dying condition—septic endocarditis was the diagnosis. She had been ill for several years. To my mind the numerous gold crowned abscessed teeth and two fixed bridges dating back to the time that she was eleven years of age told an eloquent story.

Three years ago the mayor of one of your nearby cities came to me with a widespread and exhaustive dermatological complaint. He was indeed very ill, barely able to walk and he suffered greatly when in sitting or lying down position. This condition dated back many years during which time he had the best treatment but apparently without avail. Following my examination I referred him to a dermatologist of wide renown with the request that he consider my findings and direct the management of the case. He referred the patient back to me the following day with recommendations to clean up the mouth of its pathology. We operated and removed several teeth and the man went home three days later greatly improved. He returned for further treatment and within a month he was back to work, the surface lesions disappearing while his general condition continued to improve. Lest the weight of this situation be not fully understood, let us compare the functional value of a tooth with that of a tonsil and the surgical risk of the former with that of the latter or a laparotomy, that we might realize how much greater is the risk in speculating with deeper seated pathology.

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Oral Sepsis in Relation to Eye, Ear, Nose and Throat Disease

By LESTER R. CAHN, D.D.S.,
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That oral sepsis has a malevolent effect upon the eye, ear, nose, and throat is well known. The anatomical relationship between the mouth and these organs renders them vulnerable to any inflammatory process in the jaws. However, all conditions are not due to the spread of infective material along natural channels, such as the Eustachian tube and the maxillary sinus, but the infection may be carried by the blood stream from a focus in the jaw to the eye, ear, and so forth.

Crow, an English otolaryngologist states (1) that in all probability ninety-five per cent. of middle ear troubles arise from infection passing along the Eustachian tube from the nasopharynx, and that it can readily be seen that many cases of otitis media, both catarrhal and suppurative, might occur as a result of oral sepsis. He records the case of a man thirty-six years old, who for three years had suffered from a suppurative otitis media and pyorrhea. A radical mastoid operation was performed, but the result was not as expected, pus being profuse for some weeks. Ultimately the teeth and gums were treated and his improvement was so marked as to leave no doubt as to the cause of the delayed cure. Since this case Crow has postponed operation, in every middle ear case, wherever possible, until proper attention has been given to the mouth.

Bellei (2) reports the case of a woman who had suffered from chronic pyorrhea for many years when symptoms of acute mastoid suppuration developed suddenly. She was operated upon for this condition but septicemia developed and she died. He was of the opinion that the mastoiditis was due to infection from the mouth.

Tinnitus is frequently due to oral sepsis. In this case it is a toxic neuritis. When the cochlear part of the eighth nerve is affected there is tinnitus, and when the vestibular portion is affected the result is vertigo. Impacted teeth are another source of tinnitus.

OTALGIA.

Pollitzer states that dental caries is the most frequent cause of otalgia in children. In cases of otalgia where there are no inflammatory or other abnormal phenomena in the ear itself to account for the trouble, the teeth should always be examined, as under such conditions they are invariably the cause of the complaint. Even where there is evidence in the ear to account for the pain, the possibility of the teeth being a contributory factor should not be neglected. Impacted and unerupted teeth are frequently the cause of severe chronic otalgia. Pressure of these teeth on the dental nerves would cause reflex pain in the ear.

DEAFNESS.

This affection, when there is no lesion in the ear, may be traced to an impacted or unerupted tooth. Mr. J. Howard Mummery (3) reports a most interesting case of deafness on the left side which had existed for some months. There was also delayed eruption of the third maxillary molar. The hearing was relieved to a great extent by the removal of this tooth, and fully restored on the same day.

TONSILLITIS AND PHARYNGITIS.

The tonsils and pharynx can become involved by direct continuation of an infection from the gums and oral mucosa. Hunter states that chronic pharyngitis is due, in a large percentage of cases, to oral sepsis, and in these cases the pharyngitis is usually coupled with a septic gastritis. G. J. Stewart (4) examined 231 cases of unilateral enlargement of the tonsil in school children. He found that in 135 cases there was dental caries, generally of the lower molars, and oral sepsis on the side of the affected tonsil; in 67 caries and oral sepsis existed on both sides; in 15 there were caries and oral sepsis on the opposite side, while in 14 there was neither caries nor oral sepsis. He states that unilateral enlargement of the tonsil is not found in infants. In the same paper he cites cases of laryngitis that cleared up by the treatment of the associated oral sepsis. Steadman, after examining a large number of patients afflicted with cancer of the throat and stomach, remarked that in every case of malignancy of the throat and stomach there was oral sepsis.

PURULENT RHINORRHEA.

Purulent discharge from the nose is often due to infected upper anterior teeth. There may be a fistulous tract leading directly from an upper incisor into the nasal cavity and therein discharging. We often find the upper anterior teeth penetrating the nasal floor. The following case is illustrative of this type of disease:

Case I.—M. S., aged twenty-eight, suffered from recurrent abscesses in the nose for a number of months. When these abscesses appeared they were lanced and for the time being he was comfortable. The frequent recurrence of the condition led to a search for the probable cause, and a radiographic examination was made of his teeth. The upper right central incisor was found to have a partly filled root canal and the apical bone was rarefied, indicative of a chronic infection. The upper left central incisor appeared normal in the radiogram but proved to be nonvital on clinical test. Upon opening up the left central incisor there was a considerable flow of pus from the canal. The area was drained and the root canal sterilized and filled. The upper right central incisor was also opened, the old root filling removed, and the canal sterilized and refilled. In over a year there was no return of the nasal trouble. The patient was fortunate in retaining his teeth. Inasmuch as they were front teeth, we decided to try and save them, and if there was no reappearance of the nasal trouble after the teeth were treated, we could feel assured of the success of our treatment. This is not possible, however, in every case. We often have to resort to extraction, or at least to amputation of the apex of the affected tooth.

The foregoing case is readily understood when we consider the close anatomical connection between the upper anterior teeth and the floor of the nose. The next case is more interesting because anatomically there is no relationship between the affected tooth and the seat of disease, and the resultant infection must have been borne by the blood stream.

Case II.—H. H., aged twenty-two, was referred for dental examination solely, no mention being made of any other ailment. Radiograms were made of the jaws and the teeth, and the right lower first bicuspid was discovered to have a large rarefied area apically, which we decided to remove. The tooth was accordingly extracted and the diseased area curetted. The wound healed uneventfully. About three weeks after the removal of the tooth, the patient said that the day following the extraction a purulent discharge from the nose, which had been treated for over a year and a half, had disappeared. It is now nearly two years since the removal of the tooth, and there has been no recurrence of the nasal disease.

MAXILLARY SINUSITIS.

Opinion is varied concerning the relative importance of the teeth upon the diseases of the antrum. Rhinologists place the teeth as the cause of about twenty-five per cent. of the cases of antral disease, while oral surgeons place the average as high as ninety-five per cent. It is generally felt, however, that infective conditions arising in the upper teeth are the greatest causes of maxillary sinusitis.

In any disease of the accessory sinuses of the nose, the influence of oral sepsis upon these conditions must be borne in mind. The mouth should be carefully examined, and if found diseased should be treated before any operative procedure upon the sinus is undertaken. As far back as 1850, Bond in his book entitled *Dental Medicine,* cites the following case which ended fatally.

Case III.—Miss W., a maiden lady of about fifty years of age, in comfortable circumstances and for the most part of sedentary habit, had suffered much from pain in the right cheek. For some time it was not considered of much moment, but on its continuance a physician was consulted. He found a single tooth, one of the second molars, in the superior maxillary of the affected side, and that was in a semidecayed state. The gums above the tooth and for a half an inch on each side of it were much swollen and of a vivid red color. The tumor seemed spongoid and fluffy to the touch, but there was neither fluctuation nor abscess. The patient's health had not sensibly deteriorated. She said the tumor on the gums had existed for many weeks, but had not been attended with any great pain, until the occurrence of the pain in the right cheek of which she complained. She described it as being deep in the cheek and generally dull, but now and then, for an instant, sharp and lancinating. She said the tooth for several years past, had ached occasionally, but that, notwithstanding its decayed state, it was very useful and she had declined having it extracted. The immediate extraction of the tooth was thought advisable, however, and with her consent, was effected. A week afterward the spongy tumor of the gum continued, without any abatement of the pain in the cheek. The tumor was now laid open with a lancet. It contained no matter but was filled with those shaggy or shreddy fungi which are often seen to occupy tumors or diseased bones. An abscess or some other affection of the antrum was suspected. A perforation was therefore made in its cavity, and a tablespoonful of very dark brown matter discharged, which gave the silver spoon into which it was received a thin coat of the blackest pigment, and on account of its offensive smell, was almost insupportable. There was difficulty in reaching the disease with remedies, and it was thought advisable to enlarge the communication with the antrum. The crown of a small trephine was accordingly applied to the alveolar portion of the superior maxillary, the soft parts having first been dissected, and a corresponding portion of the bone was removed. The end of the little finger could now be introduced into the antrum, the inner surface of which, it could easily be seen, had, at several points, been denuded of the pituitary membrane and the periosteum.

The disease was now fairly exposed, and nothing could exceed the offensiveness of its fetor when not corrected by suitable dressings. The usual antiseptics and detergents were applied locally, while tonics and a generous diet were prescribed to sustain the patient's general health, and every effort was made to substitute a healthy secretion for the ill conditioned and offensive discharge from the antrum, but without success. An irremediable necrosis seemed to have taken possession of the affected side, which soon began to come away piecemeal. In the meantime, the soft parts were laid waste by the phagedenic character of the ulceration, and the eye on the same side became seriously affected. The disease now progressed rapidly. The perforation of the antrum was made on March 11, 1821, and on May 28th, following, the patient was found in a perfect state of apoplexy, the disease having penetrated the base of the cranium and seized upon the brain itself. On May 30th she expired, and was thus relieved by death from the most horrible disease which can be conceived, but which had its origin in a neglected carious tooth.

DISEASES OF THE EYE.

Ocular disease as the result of oral sepsis is not by any means a modern theory. Fabricus Hildanus, a couple of centuries ago, reported a case of ophthalmia and loss of eye due to abscess of a tooth.

Blepharospasm is frequently occasioned by reflex irritation from the teeth. Excessive blinking is a mild variety of chronic spasm of the orbicular muscles of the eyelids. Colyer (5) quotes Knies as having seen a case of this kind cured immediately by the removal of a painful tooth. Colyer also expresses a most interesting statement when he says that blepharospasm occurring in old people having edentulous jaws may be due to an osseous sclerosis, causing spasm of the muscles reflexly by the imprisonment of the filaments of the dental nerves. Convergent strabismus is often associated with primary dentition. Myopia due to chronic contraction of the ciliary muscle will ofttimes be cured by the relaxation of the muscle after the dental irritation has been removed. Orbital cellulitis quite commonly occurs as a result of extension of an inflammatory process from the superior maxilla.

A fourth case will be included in the author's reprints; also his references.

A New Method for Directing the Central Ray at a Predetermined Angulation with the Aid of the Dental Methograph

By JOHN F. FREUND, D.D.S.,

New York.

The factors for accurate radiographic reproductions of parts have long since been established. The amount of current to be used, the force of the current, the distance from the target focal point to the object to be taken, the proximity of relationship between the object to be taken and the film, proper dark room technic, immobility of the parts during exposure, and the necessary angulation for the direction of the central ray through the object to be taken to the film, have all been formulated and reformulated innumerable times.

All of the factors mentioned above, with the exception of the last two, concern themselves directly with the production of contrast and detail and the last two, the immobility of parts and the proper angulation, concern themselves with an accurate reproduction of parts without distortion, either in a lateral or a longitudinal direction. The solution of these factors has ceased to be a problem in general radiography, but cannot as yet be dismissed in dental and oral radiography.

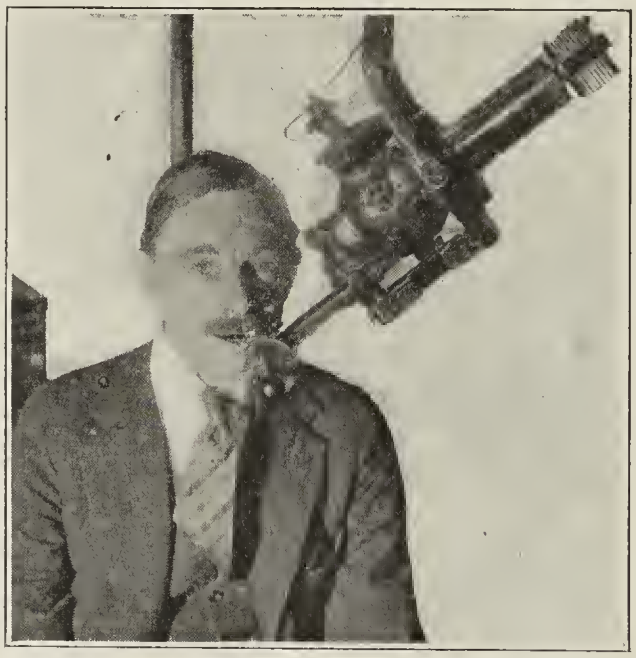

FIG. 1.—This represents the patient with methograph in position. The patient bites into the bite plane and automatically the film is placed in its proper position toward the area to be taken, while the x ray tube, with its holder suspended in air, adjusts itself by the pre-determined angular position of the methograph in the desired position toward the object to be taken and the film in the mouth. The bite plane with the impression of the upper and lower teeth is then filed, together with a record of the angular position, and by this means it is possible either to duplicate the original exposure or correct any further exposure that may be made.

On account of the peculiar relation between the position of the teeth and surrounding bones, particularly the superior maxilla, it becomes impossible to place the film directly against the tooth and the immediate surrounding tissues. Early in the experimental work of Dr. Satterlee and others, the formula for directing the central ray perpendicular to the line bisecting the angle between the long axis of the tooth and the position of the film was established. The difficulties encountered, however, in controlling the central ray, the slightest variation producing a distortion in either a longitudinal direction, or a lateral direction, were yet to be surmounted. More recently Dr. Van Woert, with his specially designed cone, succeeded much better in controlling and focusing the central ray, but again the procedure has not been accurate, the degree of angulation not having been accurately established.

The foregoing statements were prepared at my request by Dr. M. Diamond, of New York, and summarize the progress made in regard to the taking of dental radiograms.

The object of my effort from the beginning has been to create, by means of new mechanical devices, a technic for taking dental radiograms which would produce a true reproduction of the object to be taken. This is accomplished by a predetermination of the angle between the film and the object to be taken, and the relation of the central ray toward the object and the film. Such predetermination must necessarily eliminate the uncertain factors.

It has also been my aim to devise a simple method for accurately duplicating any number of dental radiograms of the same area at any subsequent interval of time. This method by means of its simplicity is to be within the reach of every dental practitioner.

By means of such a procedure the dental practitioner would be placed in a position to determine changes which have taken place during that lapse of time in the object or part taken, more accurately than can be accomplished by the use of methods previously known.

This method will make it possible to produce a dental radiogram, correct in its expression in regard to proper angulation. A record of the angulation at which the dental radiograms was taken by a technician would materially aid the diagnostician in making his proper diagnosis. Such a record would include the direction of the central toward the object to be taken as well as the angle between the object to be taken and the film of the mouth.

To acquaint you thoroughly with my ideas and the basic principles involved, I shall attempt to explain the changes from the present method brought about by my device.

1. The methods for taking of a dental radiogram, so far known, have three points of fixation. The x ray tube must be fixed in its holder upon the stand in such fashion that a firm rigidity will be maintained. The patient's head, that is, the object to be taken, must be rigid during the making of the exposure. Neither must the film in the mouth shift. The method I present has only one point of fixation—the x ray tube, the object to be taken and the film in the mouth are brought into one point of fixation by means of a bite plane.

2. The horizontal and vertical plane as well as a lateral shift forward or backward are also brought into one point of fixation by means of the dental methograph.

3. In taking stereoscopic dental radiograms the focal point of the x ray tube is no longer shifted the distance between the pupils of the eyes in a horizontal direction, but instead the object to be taken

and the film in the mouth are adjusted by a predetermined angular position toward the central ray of the x ray tube.

4. By means of the bite plane, the relation between the object to be taken and the film in the mouth is definitely established and if replaced can always be restored at any interval to its established original position. It is by this means that we are able to duplicate the original dental exposure, at any subsequent interval.

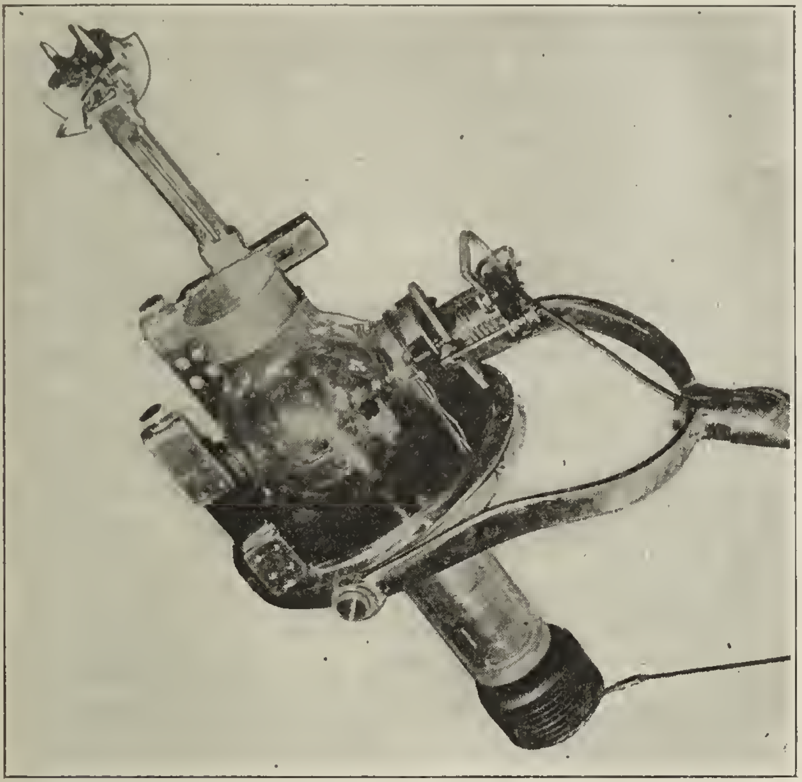

Fig. 2.—This shows the tube in its holder with the necessary device for placing the methograph in its proper position.

5. The methograph makes it possible to no longer focus upon the patient. The film is placed in the mouth in position facing the area to be taken and we then focus directly upon the film. (Figs. 1, 2, 3, 4, and 5.)

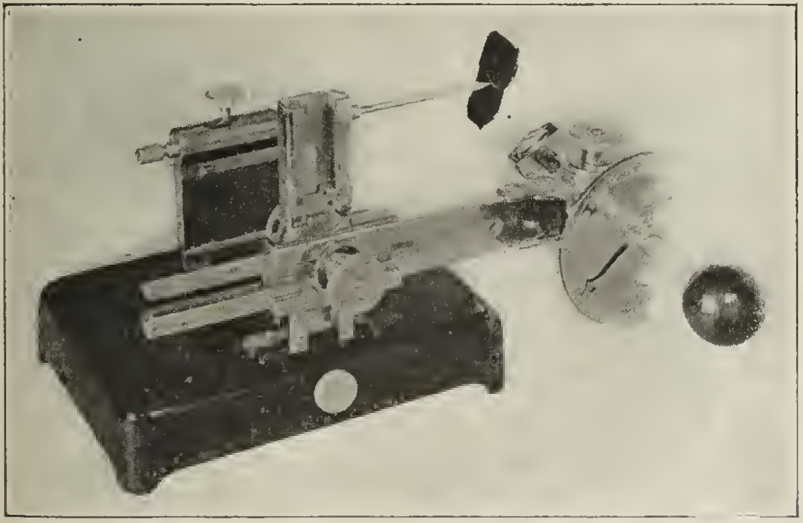

Fig. 3.—The methograph adjusted on its stand with film bite plane in place and pointer representing the main rays of the x ray tube, as well as the vertical tilt of the object to be taken, and the film in the mouth toward the main ray of the x ray tube.

The taking of stereoscopical dental radiograms is made possible by the simple procedure of shifting the horizontal angle of eight degrees when the distance of the target of the x ray tube from the object to be taken is between seven and eight inches. The shifting of this angle of the horizontal position is determined by the distance between the target of the x ray tube and the object to be taken. Let me say finally, that what holds good for the taking of intraoral pictures is also applied in the simplest way possible and under the same conditions for the taking of extraoral radiograms.

To make clear to you the extreme efficiency of the methograph, let me say that we are enabled, not only to duplicate at intervals any dental radiogram desired, but also can duplicate stereoscopic radiograms at any interval of time, something that no one else has ever been able to accomplish.

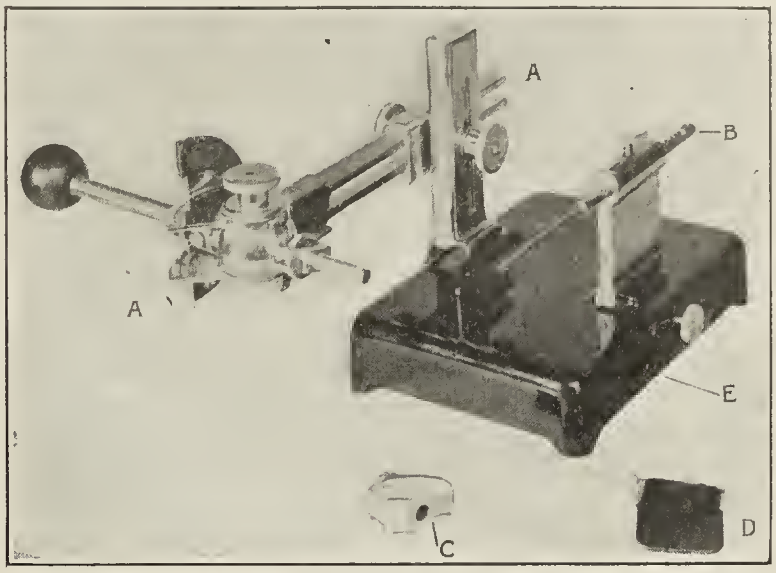

Fig. 4.—A. Vertical and horizontal plane, with lateral forward and backward shift, upward and downward movement, for the taking and recording predetermined position in space. B. The pointer representing the focal point of the x ray tube. C. The bite plane which is covered with modeling compound to record the bite of the patient. D. Film holder with film in position. E. Stand on which the measuring device A and the point of B is placed, representing the same position when A is placed in the holder of the x ray tube as B the pointer, representing the focal point of the x ray tube.

Before we dismiss this subject I wish to call attention to a vital fact, which cannot be given too careful consideration. This is, that what holds good for the use of the methograph in dentistry applies with equal efficiency to the use of the methograph in the practice of medicine. By means of this method the medical profession will be enabled to direct and control the central ray with absolute accuracy for both diagnostic and therapeutical purposes.

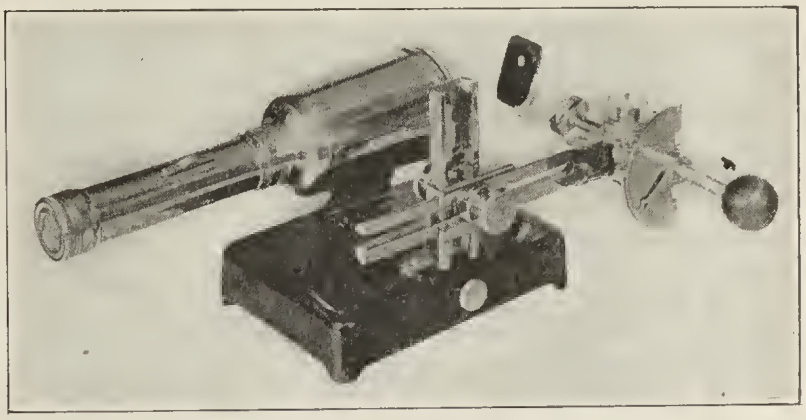

Fig. 5.—The pointer B is replaced by an electric light socket, representing the exact condition of the main ray of the x ray tube toward the film. This illustrates very precisely how accurately one is able to direct the main ray, no matter how small the shutter is, toward the object to be taken. One is thus always secure in directing the main ray precisely toward the part you wish taken, and by means of the diaphragm eliminating all unnecessary exposure of the x ray. In this way one has the privilege of exposing as much of the area as is desired.

In conclusion, may I hope that the presentation of my foregoing technic will add toward the standardization of the taking of radiographs, particularly in the direction of controlling the central ray.

120 Broadway.

Editorial Articles

ORAL SEPSIS

Little more than a dozen years ago, the pathology of teeth and their surrounding tissues held virtually no place in the etiology of organic diseases. Today the noninclusion of a careful examination of the buccal cavity in the general history and examination of the patient, no matter what the malady may be, is regarded as a serious oversight. While at the present time there may perhaps be a tendency to overestimate the importance of oral pathology in relation to certain specific diseases, it is really difficult to overestimate the importance of the part played by dental sepsis in establishing the etiology of constitutional disturbances that hitherto were obscure.

The responsibility of eradicating existing foci of infection from the mouth and the even greater responsibility of preventing oral sepsis rest with the dental profession. To rebuild, mechanically, the masticatory apparatus is a difficult problem; but while a normally functioning and properly balanced full complement of teeth is imperative, reconstruction of the dental apparatus is not to be effected in defiance of the normal physiological behavior of tissues, nor is it to be effected at the expense of oral asepsis. There have been sad mistakes in the methods of reconstruction employed, especially the shell crown and the fixed bridge. These mechanical contrivances enjoyed a vogue of more than half a century before the extensive pathological conditions produced in the mouth, and the resultant systemic disturbances, awakened the sensitive perception of two personalities almost simultaneously.

It is interesting to recall the expressive language used in a lecture delivered in 1910, at McGill University, Montreal, by Dr. William Hunter, whose part in establishing the relations between oral sepsis and systemic disease are quite familiar to us all. "It is not a matter of teeth and dentistry. It is an all important matter of sepsis and antisepsis that concerns every branch of the medical profession and concerns very closely the public health of the community. It is not a simple matter of neglect of the teeth by the patient but one of neglect of a great infection by the profession. Oral sepsis is more important as a potential disease factor than any other source of sepsis in the body."

And teeth and their needs ceased to be a matter of local consideration, they became an integral part of the entire constitution.

Equally decisive criticism appeared within the ranks of the dental profession, in an article entitled Empiricism of Bridgework, by Dr. Herman E. S. Chayes, which was published in the October, 1910, issue of *Dental Items of Interest*. He said: "Crown and bridgework have had a decidedly disintegrating influence upon the human economy; it has been the worst sort of a makeshift, and if at times its work has been hidden in a period of temporary satisfaction, it has been no less destructive in the end. It has become apparent upon close study of the dynamics, physics and relations involved that no important point necessary to the success of the appliance and essential to the physiological well being of the patients and to their hygienic integrity has been considered, except, perhaps, the one requirement of filling the space which presents itself devoid of dental members."

These critical attitudes are today assumed by both professions, after amassing clinical evidence, the compilation of which would fill volumes. And yet a great deal of sepsis is still being induced through improperly inserted fillings and inlays, and much more that comes under the head of dental reconstruction. The prevention of oral sepsis is a goal still to be attained. Just how it will be accomplished, the dental profession will eventually formulate. Perhaps a stricter observance of the principles of general surgery will be of assistance.

A MILESTONE IN DENTAL EDUCATION

The standards of education in dentistry have varied considerably since the first undergraduate school was organized in this country in 1839. For many years the dental school was more in the nature of a trade school, concentrating entirely upon the mechanical phases of dentistry with practically no requirements for entrance. Gradually the medical sciences were included in the curriculum of the dental school and the entrance requirements were becoming a selective factor. The establishment of dental schools as a part of such universities as Pennsylvania, Buffalo, and Harvard, removed the study of dentistry from the realm of the privately owned institution.

The rapid development in the various departments of dentistry made necessary a change in the curriculum from a three to a four year course of study soon after the world war, and considerably more attention was paid to the medical sciences in the new curriculum. The predental requirements, however, remained the high school diploma and in some privately owned schools, the regents equivalent in points. At this time the School of Dentistry of Columbia University was organized and took the lead in establishing new standards of education. The difficulties of reorganization were great but rigorous standards were maintained. The new two year predental requirement placed the Columbia dental student on a selective par with the Columbia medical student, the dental students taking their medical subjects in the medical department. In the meantime, the other schools were gradually raising their predental requirements one year to meet the demands of higher education. The privately owned schools were gradually falling into line and at present one of the most interesting experiences in the history of dental education is to be recorded.

The College of Dental and Oral Surgery, a privately controlled institution, has been donated to the Columbia School of Dentistry. Credit for this move must be given to Dean William Carr, which serves as a monument to his unremitting labors in the cause of scientific dentistry extending over a period of thirty years.

Thirty years ago, Dr. Carr was chairman of the law committee of the State society, a body in whose interest he has remained active throughout his entire career. He is credited with being the maker of every dental law, especially those routing out the unqualified practitioner. His education associations began with the old New York College of Dentistry, later with the University of Buffalo, where he remained until he became affiliated with the College of Dental and Oral Surgery.

Only ten years ago the college was housed in makeshift quarters, akin to a barrack, above a penny arcade. Today, entirely through the efforts of Dean Carr, the college is housed in one of the best equipped institutions in the country, with a student body of perhaps eight hundred. It is well to remember that in accepting donations from time to time for the development of the College of Dental and Oral Surgery, Dean Carr long ago made provision for the donation of the institution to a university. His dream is now being realized, for the entire equity of the institution has been turned over to Columbia University for the legal consideration of one dollar.

The educational policy of the new school, to be known as the School of Dental and Oral Surgery of Columbia University, is to be controlled by the administrative board of the Columbia School of Dentistry. No one can fail to appreciate the difficulties attendant upon the administrative board in the new undertaking. The problems are manifold, but it is certain that the administrative board will be able to cope with them. Their sincerity of purpose, their high standards of education, and their cooperative zeal have all been demonstrated in the organization of the Columbia Dental School during the six years of their existence. It is only a question of time when the influence of their cooperative energy will be realized in the professional world, and in the community.

SCIENCE AND RELIGION

There has been a recrudescence recently of the hysterical attack of fright among religionists (religion has had no fear because there was nothing to fear) caused a half century since by the explosion of Darwin's evolutionary bomb. The present unexpected attack seems to have been brought on by a gentleman who "talks much and reads little." But for his unfortunate diarrhea of words the world of the unthinking would have gone peacefully forward. There is, however, a considerable number of scientists who are as nearsighted as the religionists at whom they smile. For these the universe revolves about the "facts" and "laws" laid down by scientists, just as for the very "religious" all things must conform to literal interpretations, according to creed, of the Bible story. A man of far vision among scientific workers is Professor J. S. Haldane and in a recent number of the *Hibbert Journal* he has worded his views of the universe (as well as words will allow, on such a large subject) in masterly fashion.

Speaking of the newer discoveries and generalizations of science he says: "The new knowledge gives a far wider scope to practical philanthropy, but at the same time seems to lead us into materialistic fatalism in which the old spiritual values have disappeared. The universe appears as a material universe which in some mysterious way has become conscious of itself in man and the higher animals, but is otherwise nothing more than a ceaseless and meaningless interaction of atoms and electrons."

"I am convinced that no escape from this conception lies in the direction of denying or doubting the connection between what we call material processes and what we call mental and spiritual phenomena. Nevertheless the conception itself seems to me altogether a false one. The thesis of this article is that the material world which has been taken for a world of blind mechanism is in reality the spiritual world seen very partially and imperfectly, and that the only real world is the spiritual world. . . .

"A living organism is often represented as a structure provided with an immense variety of delicate and extremely efficient mechanisms for preserving itself and its activities from abnormal disturbance or for ensuring their reproduction. This conception, however, is completely inadequate since all the supposed mechanisms are themselves part of what is preserved and reproduced.

"The active persistence observed in the life of the organism can only be the manifestation of a type of order which has not yet appeared to us clearly in what we call the inorganic world. We are therefore bound to believe that, under the guise of mechanically acting forces and random distribution of different kinds of matter, this order must exist in the apparent inorganic world, though we cannot yet see it except with the eye of scientific faith.

"To the materialistic philosophy consciousness is only a byproduct, or accompaniment of some kind, of the material processes in the brain. Plausible though this reasoning may seem to the present generation it makes the gigantic and unwarranted assumption that we really know what 'material processes' are.' . . .

"The reasoning of Berkeley, Hume and Kant throws an entirely new light on our conscious relations to the world of our experience. That world no longer appears as something outside ourselves—an infinity in which we are mere specks. The infinity is within us as a projection of the mind which includes all our experience. Our bodies, regarded as physical bodies, are still mere specks in the physical universe as interpreted in ordinary perception, but the interpreting mind is present everywhere. It cannot be localized in a particular body, since such localization would be meaningless. The visible universe is neither composed of isolated units of matter nor of isolated units of perception. It hangs together as a perceived whole.

"Religion is the recognition in practice as well as in theory of our oneness with God as the ultimate reality. The physical world with its appearance in time and space is, even when with Kant we regard it as a spiritual world of perception, only a very blurred vision of God. We can admire such order as exists in what appears to us the physical world; but in reality chaos and unintelligibility dominate the picture.

"Life and personality appear as miraculous and wholly unintelligible intrusions into it so that it does not hang together. In the world of mere organic life and of individual personality the vision is also a blurred one. We are no mere selfcentred individuals, outside one another, outside Nature and outside God. As individuals we are born and die, and birth and death are neither beginning nor end to real existence. In our oneness with God, but not in the fleeting and unreal appearance of our individual selves, we find immortality and freedom."

DENTAL RADIOGRAPHY

The importance of the radiograph as a diagnostic factor in dentistry is firmly established. The field of its application has been limited until recently, however, to a search for impacted teeth, the location of foreign bodies, the discovery of gross pathological conditions such as cysts, tumors, benign or malignant, and fractures of the maxillæ, and for the verification of a successful completion of root fillings. In short, its diagnostic value concerned gross structural variations rather than detailed structural variation. With the broadening of the diagnostic value of the radiograph, a general misconception ensued in promiscuously designating the presence of unexpected shadowgraphs in alveolar tissues as indicating a pathological condition and attaching a terminology to them not easy to follow on a rational basis.

The dental profession is indebted to Dr. Joseph Pollia, a physician of California, for clarifying the scope and limitations of the x ray as a diagnostic factor in determining the pathological and nonpathological variations of alveolar tissues. A periapical shadowgraph, without the additional clinical evidence, is no longer evidence of a pathological condition. It is merely evidence of a deficiency of calcium content, and, according to Dr. Pollia's findings, a certain percentage of such conditions proved upon careful examination to be sterile.

Dr. Pollia's classifications are valuable and should be sought after by the Life Extension Institute and all others who are engaged in the diagnosis of pathological variations of alveolar tissues. An important asset of the radiograph, as a diagnostic factor, is in relation to detecting the beginning of dental and alveolar pathological variations as an aid to the prevention of dental diseases.

PYLORIC STENOSIS IN NURSLINGS

The symptomatology of congenital hypertrophic stenosis of the pylorus can be stated briefly as follows: In a healthy infant vomiting (geyser vomiting) develops suddenly, and little by little, each nursing is rejected with force. Yet, the infant takes the breast with avidity. Constipation ensues, while exaggerated peristaltic movements from left to right can be seen, the stomach dilates, the urine is scanty, and the infant rapidly becomes emaciated, sometimes losing three or four ounces in twenty-four hours. Radioscopy shows that nothing passes the pylorus and that there is distention of the great tuberosity from air ingested, but no tumor can be detected.

This symptomatology leads one to envisage certain eventualities. In the first place, cardiospasm, spasm of the esophagus or malformations of the tube and subpyloric stenoses must be eliminated. When this has been done there remains the differential diagnosis between true pyloric hypertrophic stenosis and the habitual vomiting of Marfan. There are only three classes of symptoms that can serve in making an early differential diagnosis, the first being that the periods of rest are longer and more plainly manifest in habitual vomiting than in congenital pyloric stenosis. It is true that when the stenosis is not tight, there are phases of relative permeability during which the infant's general condition improves, but these periods are short.

In habitual vomiting, on the contrary, these periods are frequent and long, while constipation is distinctly preceded by a phase of diarrhea. During the evolution of habitual vomiting, the periods of vomiting alternate with periods of enterospasm; when the latter occurs the constipation is replaced by slight diarrhea. This alternating constipation and diarrhea is not met with in pyloric stenosis; it is characteristic of habitual vomiting.

Secondly, one must consider the symptoms indicating the degree of pyloric permeability by means of bismuth and the passage of inert colored substances into the feces. If permeability persists and is not transitory, the diagnosis of pyloric hypertrophic stenosis is practically certain.

Finally, one should observe the effects of diet and medical treatment. Complete failure points to a diagnosis of stenosis, and if after two to three weeks' trial no improvement ensues surgery is indicated.

It is clear that these signs have not an absolute value, but in practice this is of little import, and, what is to be looked for is the indication for surgical intervention. Now, if there is a certain degree of pyloric permeability there is no indication for operation. Radioscopy is of primary importance, as it reveals aerophagy, merycism or enterospasm.

Medical treatment has a diagnostic value as it will relieve the spasm. The number of feedings must be regulated and the important question of the infant's intolerance for the maternal milk—although very infrequent—must not be overlooked. Sodium citrate and bismuth, or a combination of the bromides with belladonna to relieve the spasm, are to be tried. Haas advises freshly prepared atropine in doses of one to two milligrams; the maximum dose being from three to four milligrams up to the age of three months. A one in one thousand solution is used. Begin with one drop at a feeding, then two, so that three to four drops with each feeding are reached in the first twenty-four hours. If at the end of two days there is no improvement, and if there is no sign of intolerance of the drug, it should be pushed so as to reach the daily dose of thirty-five drops. Haas has been successful in numerous cases with this treatment.

Adrenaline, which stimulates the sympathetic nerve ends and is antagonistic to the vagus, has been used; likewise the calcium salts. But as soon as medical treatment shows itself powerless, surgical intervention should be resorted to without further delay.

TONSILLECTOMIES IN ADULTS

It has occasionally occurred to us that a good many tonsils were being removed nowadays for peculiar reasons and with questionable benefit, but we were not quite prepared for the statement made by Walter C. Alvarez in the *Journal of the American Medical Association,* for May 26, 1923, that one out of every four patients who entered his office during the past two years had lost their tonsils. Of the 345 men and women without tonsils who passed through his office 251 had been operated upon during adult life, and he utilized these as material for a study of the reasons why the operations were performed and the results obtained. Although it is not probable that one fourth of our population is tonsilless, it is evident that, if this percentage holds in one doctor's practice, the number of adults on whom tonsillectomy has been performed is sufficiently large for definite conclusions to be drawn as to the conditions under which the operation is advisable. It seems obvious that the general practitioner is in the best position to make the necessary observations, so we commend to him a study of his patients along the lines followed by this writer.

The great benefit obtained from tonsillectomy by all the patients who had been suffering from recurrent attacks of tonsillitis contrasted very strongly with the poor results in 103 patients who had had little or no tonsillitis or sore throat. The figures certainly seem to substantiate Alvarez's contention that it does not pay a patient to have his tonsils removed on general principles, because he is run down or nervous, or because he has headache, deafness, otitis media, enlarged glands in the neck, stomach trouble, or bad breath. He does not stress the point that out of forty-seven who had had their tonsils removed because of rheumatism only seven considered themselves cured and five improved, though it seems worthy of note. But he does emphasize the fact that not one of the thirty-two persons whose tonsils were removed because they were said to be infected was satisfied with the result, and only ten could see any improvement.

Some of the reasons given why the operation was performed are extraordinary. It seems hardly possible that any physician or surgeon can have recommended tonsillectomy as a cure for such diseases as duodenal ulcer, appendicitis, tuberculosis, or acne, yet these are taken at random from the long list of reasons given by the patients why they had submitted to the operation.

Can it be possible that the theory of focal infection has taken such a strong hold upon the imagination of physicians that they are ascribing to it all manner of ills, and are advocating tonsillectomy as a panacea? Possibly, for Alvarez says that, according to his observation, the worst offenders often are physicians who have been cured of some infirmity by the removal of tonsils or teeth and are so impressed that they insist upon their patients submitting to the same therapeusis. The thought occurs to us that possibly the mysticism inherent in the idea of focal infection may play some part, for experience has proved that human nature demands mysticism in medicine. Nothing has ever been propounded so utterly at variance with reason, possibility, or known fact as not to be welcomed as the basis for a new medical departure, and we, although physicians, have a good deal of human nature. We don't understand how a possible focus of infection in an apparently healthy tonsil can make a patient dizzy, insane, or constipated, but, being beyond comprehension, it may be medically right, so, perhaps if we remove the tonsils the patient will get well. The patient's human nature rejoices in the mysticism and accepts the operation.

Tonsillectomy should not be performed on an adult for trivial troubles. Eight per cent. of the 251 patients were made worse, or suffered much for a long while after the operation. It should not be done for relief of troubles elsewhere than in the throat until the patient has been studied carefully by a competent internist. Conservation should be the rule except when there is good reason to believe that the disease can be influenced by the removal of a focal infection, and when there is some reason to thing the focal infection is situated in the tonsil.

RAT PROOF BUILDINGS

An editorial in a recent issue of the Boston Health Department *Bulletin* urges that city to make its buildings rat proof, as a preventive measure against the plague and as an economic necessity. Bubonic plague, formerly known as the black death, is primarily a rat disease, spread to human beings by fleas from sick or dead rats. The only way to eradicate the disease, as has been demonstrated many times, is to stop it among rats, and the only way to do this is to destroy as many rats as possible. To do this, shut off their food supply and deprive them of breeding places and refuges. It has been found necessary at times to rebuild whole cities in order to destroy the rats.

Within a few months after the outbreak of plague in New Orleans, private property owners had been required to pay more than a million dollars to rat proof their buildings. When the plague appeared in Galveston a few years ago, Federal and State officials did not wait for rat proofing by property owners, but demolished buildings and ripped out walls which were harboring rats to such an extent that it was estimated that within a few weeks one twenty-fifth of the entire floor area of the city had been torn away and the owners left to rebuild in a rat proof manner at their own expense.

The article referred to above states that from estimates based on government surveys it may be assumed that there are as many rats in Boston as human beings, and that each rat destroys property annually to the value of about two dollars, which means that it costs about $1,500,000 each year to support Boston's rat population.

As a result of the experience of the world in fighting the plague during the past twenty-five years, the cheapest and most effective way of rat proofing a building of any type of construction has been satisfactorily worked out by the Federal Government. Definite information on the subject will be furnished by the government, but property owners and builders seem to be reluctant to avail themselves of this information. It is also to be remembered that rat proof construction always means increased fire protection for a building and its contents, even if it does not involve actual fire proof construction.

THE DENTAL HYGIENIST

In no part of the body is the need for prophylaxis so great as in the oral cavity. The mouth is the most direct source of infection, where the greatest variety of bacteria can be found. Additional deposits of calcareous substances from the salivary secretions plus the remaining particles of carbohydrate food adhering to the teeth, make the need for oral prophylaxis a most potent factor in the prevention of oral diseases.

It was fitting, therefore, that a special oral hygiene department be organized and that the prophylactic care of the mouth be entrusted to individuals specially trained in the hygiene of the mouth. Such a department was established about seven years ago in Columbia University and is known as the Columbia School of Oral Hygiene. During these seven years some three hundred young women have been graduated as dental hygienists in this city. At the same time schools have been started in Rochester, N. Y., and in Boston, which are splendidly equipped to carry on the campaign for preventive dentistry.

At present the services of the dental hygienist are being utilized in some dental offices, in certain industrial institutions where employees are cared for, in many orphanages, and, in conjunction with the department of health, in a few selected public schools. Unfortunately, the number of dental hygienists is still inadequate, but it is to be hoped that the authorities will make provision for supplying all public schools with dental hygienists. Their services are invaluable, especially in schools, where the groundwork for preventive dentistry should be laid.

News Items.

Dr. Joseph F. Montague Elected to Office.—Dr. Joseph F. Montague was elected to the office of secretary-treasurer of the American Proctological Society at their annual session in Los Angeles.

Dr. Norris Sails.—Dr. Charles Norris has sailed for a vacation in Europe. Dr. Norris will tour Austria, Italy, France and Switzerland and at the same time will study foreign methods of handling the problems with which he is confronted in his duties as Chief Medical Examiner of New York. He will return September 16th.

Dr. Blanche N. Ehler Appointment.—Dr. Blanche N. Ehler, of Hatteras, N. C., has been appointed by the United States Public Health Service to furnish professional services to Coast Guard Stations Nos. 181 to 185. She will also examine candidates who apply for admission to the Coast Guard service at stations under her medical supervision.

Dr. Leland E. Cofer Appointed.—State Industrial Commissioner Bernard L. Shientag has announced the appointment of Dr. Leland E. Cofer, of New York, as director of the Division of Industrial Hygiene of the State Department of Labor. Dr. Cofer has been an officer in the United States Public Health Service for over thirty years .

Dr. Flexner Appointed Health Council Head.—Governor Smith has announced the appointment of Dr. Simon Flexner, of New York, as chairman of the public health council, to fill the vacancy cansed by the death of Dr. Hermann M. Biggs, formerly State health commissioner. Dr. Flexner is director of the Rockefeller Institute for Medical Research.

Vital Statistics for Massachusetts.—Statistics show an increase in deaths and a decrease in marriages and births in Massachusetts during the past year. Last year there were 87,636 births, or 22.3 in a thousand of population, as compared with 92,207, or 23.7 in a thousand in 1921. Marriages numbered 32,683 in 1922 and 33,590 in 1921. Deaths were 51,115, or 13 in a thousand, in 1922, and 47,780, or 12.3 in a thousand, in 1921.

Dr. Hunt Heads Tuberculosis Division in Veterans' Bureau.—Dr. James P. Hunt, of 58 West Fifty-third Street, Manhattan, has been appointed head of the tuberculosis division of the veterans' bureau, succeeding Dr. Stanley M. Rinehart, who resigned to accompany his wife, Mrs. Mary Roberts Rinehart, to their ranch in the West. Dr. Hunt was formerly attached to Bellevue Hospital and also to the New York office of the Veterans' Bureau.

Dr. Nicoll Health Chief.—Dr. Matthias Nicoll, Jr., of Albany, has been appointed by Governor Smith, State Commissioner of Health, to succeed the late Dr. Hermann M. Biggs, who had held the post since 1914. Dr. Nicoll has been with the department for the past eight years and for the past four years has been deputy commissioner. Prior to that time he was secretary of the department and director of public health education. Before he came to Albany he was associated with Dr. Biggs and Dr. William H. Park in public health and laboratory work in the Department of Health of the City of New York.

Dr. L. Miller Kahn Appointment.—Dr. L. Miller Kahn has been appointed attending surgeon to the Beth David Hospital.

Industrial Accidents Increase.—According to statistics compiled by the Department of Labor and Industry, Harrisburg, Pa., industrial accidents for the last six months totaled 100,421, the highest postwar casualty record. A slight decrease in fatalities for June was reported.

Influenza Ravages Chile.– Santiago is in the grip of an influenza epidemic. More than 100,000 cases have been reported, most of them among the poorer inhabitants. The extremely cold winter is believed to be aggravating the situation.

Governor Breaks Ground for Hospital.—Governor Alfred E. Smith broke ground for the new Veterans' Memorial Hospital at Kings Park, L. I., near the State Hospital for the Insane. The buildings when completed will cost $1,500,000 and will house at least 1,000 of the 1,400 insane veterans in New York State. Funds for the hospital were appropriated after Governor Smith had sent a special bill to the legislature.

Turks to Have Their Teeth Filled.—A decree has just been issued by the Department of Religious Affairs permitting the Turks to have their teeth filled. Although, of course, the educated Turks for many years past have had dental treatment when necessary, the peasants of Anatolia, rather than transgress the law often allowed their teeth to become hopelessly decayed and contented themselves with having the most troublesome teeth pulled.

Cornell Scholarship Award.—A travelling fellowship in medicine has been established at the Cornell University Medical College for 1923-1924 amounting to $2,000. It is available for men and women who have graduated from Cornell within ten years or who are graduates of other medical colleges within ten years but who are now attached to the instructing staff of Cornell. Candidates must have completed a hospital internship or have engaged in laboratory training or research for two years after graduation. This year's fellowship has been awarded to Harold Edwin Himwich who obtained the degree of B. S. from the College of the City of New York in 1915 and an M. D. degree from Cornell University in 1919. Since that time Dr. Himwich has been an interne at Bellevue.

Notice of Postponement.—The Committee of British Ophthalmologists appointed to organize an International Congress in 1925 announces that it is unable to do so in accordance with the conditions under which the British invitation was accepted by the Washington Ophthalmological Congress in 1922. At Washington it was decided that the next Congress should be strictly international and that German should be one of the official languages. The committee has since been informed that the Société Française d'Ophtalmologie, the Société d'Ophtalmologie de Paris and the Société Belge d'Ophtalmologie have passed resolutions to the effect that they feel themselves unable to participate in a congress if Germans are invited. The committee believes that to proceed with the congress in these circumstances would tend to perpetuate a schism in the ranks of ophthalmology and therefore decided to postpone the congress.

LATIN AMERICA LETTER.

(*From our own correspondent*).

Balboa Heights, *May 20, 1923.*

AMERICANS IN THE TROPICS.

Every year there is an increasing tide of American travel to the tropics, particularly to Central and South America. A considerable proportion of this is along the beaten tourist routes and involves about as much of a health hazard as a trip to a Sunday School convention at Sioux City. The balance represents a definite emigration for the purpose of engaging in diplomacy, engineering, medicine, trade and land development, and to this group there may be an actual menace. To be sure, the American Minister at, let us say, Panama is just as safe as he would be in Paris, because every sanitary precaution has been taken for him by the health authorities, and life differs really very little from what it is at home. On the other hand, the engineer or physician who is out on an oil development project in Venezuela must rely on his own intelligent effort, and if he is ignorant of the basic principles of maintaining health, he is apt to be recruited to that vast army of Nordics who perpetuate the ancient superstition that the blond white man is not adapted to life in warm climates. This applies with even greater force to those transplanted American women who persist in taking their daily dozen, in the hammock or at the bridge table, and to whom a freckle is about as welcome as leprosy.

DEGENERATING EFFECT OF LIFE IN THE TROPICS.

There is a widespread belief, even among medical men, that there is something about life between 23½° N. and 23½° S. which rapidly undermines the health of all white people, except those from the Mediterranean basin. A moral, dispositional and physical retrogression is supposed to result from its malign influence, and neurasthenia, hypochondriasis, and insanity are supposed to follow in its train. Even many tropical dwellers harbor this weird belief and explain the results of overdrinking, overeating, underexercising, and the violation of the most fundamental rules of personal hygiene by the trite phrase, "He has missed too many boats." Continuous high temperatures, white light, humidity, and the combination of all three, have been blamed, yet, strangely enough, the baleful symptoms of this mysterious ailment are observed in dry and humid, bright and cloudy climates, on mountains and at sea level, in cool and hot tropics alike; and, still more strangely, there are many Americans who have resided for many years in Central and South America without undergoing physical, mental or moral deterioration. They are the Nordics who have adjusted themselves to the new environment and the boredom of a climate with relatively little seasonal change, who have had the courage and the initiative to resist the slump which so frequently follows isolation from one's own kind. It must be admitted that there is a dangerous lassitude about warm countries. It is so easy to omit shaving in the morning or to slouch around the house in a "mother hubbard;" in a country where few wear shoes "and restaurant waiters strut about with shirt-tails out behind," the lowering of one's standards is not difficult. The Englishman learned this long ago and when he moves to the tropics, he takes a little bit of Merrie England with him and clings doggedly to his customs and conventionalities for the salvation and protection of his soul and body. The fact is, that people of the same general habits have about the same degree of health, no matter what their exact geographical position may be, and that every infraction of the laws of health is punished, no matter where committed. To be sure, one does not dress, eat and exercise in exactly the same way in Curacao as in Chicago, any more than one would follow the same regimen of life in Memphis and Moscow, but, leaving out of question the communicable diseases, personal health is largely a matter of character and intelligence, that is to say, of cleanliness, diet and exercise.

PERSONAL CLEANLINESS.

Personal cleanliness is even more necessary than in temperate climates, if one is to avoid skin infections. In the humid tropics thorough soap and water baths should be taken at least daily. Some skins require the application of a little fresh coconut oil after bathing. The hair must be washed frequently and it is wise to practice axillary shaving. The various forms of ringworm and other skin parasites are very prevalent and every wise white man living in the moist tropics keeps a little tin of dhobie itch ointment on hand ready to apply at the first indication of skin infection. Except in the very dry tropics, it is always possible to take a bath. Shower baths may be rigged out of perforated oil tins and in temporary locations, a native may always be secured to pour water over the bather from a height. Towels and washcloths should be sterile. This is important and is not difficult to achieve if care is taken that the lavendera dries them on a line or a sheet of corrugated iron in the broiling sun. They should never be dried on the earth or grass. After the bath, clean clothing should be put on from the skin out. This requires a fairly large wardrobe of underwear, stockings, shirts and suits or dresses and naturally entails considerable laundry work. The latter is not expensive and the outlay for clothing not as great as in the United States, e. g., the laundry work for a family of two will cost from three to twelve dollars gold a month, varying with location, and three export flour sacks, which may be purchased for twenty-five cents each, may be made into a very serviceable and good looking suit of clothes by a native tailor for eight dollars.

CLOTHING TO BE WORN IN TROPICAL COUNTRIES.

The kind of clothing to be worn naturally depends upon the climate and here it is wise to conform to local customs. In the warm tropics the basic idea to be followed is that of bodily ventilation and sun and weather protection. Underwear, stockings and shoes, both whites and leather, are better brought from home. Wash clothes can be secured more cheaply locally. For rough work in the jungle, breeches and boots or high shoes and snug puttees are necessary for protection against ticks and the like. The bare foot should never be set upon the ground, in fact, the danger of contracting hookworm infection is so great that, even in the house, shoes or native slippers like the hempsoled alpargata should always be worn. For headgear, the Panama hat is light and comfortable. In purchasing, one should always hold the hat to the light to see if it leaks light and count the rings in the crown and examine the edge to determine the quality. For the wet season the Army Stetson is admirable. A good many Americans have a prejudice against the helmet but it really is an excellent piece of headgear, the pith or semicork variety affording sun protection and the ones of rubber composition shedding water well.

DIET.

Diet is largely a matter of personal taste but, as a rule, it is wise to study the local dietary carefully and adapt it to the American palate. The housewife who is hidebound and insists on serving the menu which was the rule in the particular Mink Centre from which she originated is taking dangerous liberties with the digestions of her family. She must do her own marketing and she must learn to avoid the tin can, smoked meat, sausage, crackers and cheese diet which has driven many a good husband to the cantina. Equally she must busy herself with the native cook lest she serve greasy red beans and rice, garlic and stew with frightful and odoriferous monotony. The newcomer is pretty apt to have a preliminary stimulation of the appetite and digestive functions but this soon passes and the taste for food and the powers of assimilation are lowered. This and the failure to eat sufficient roughage may explain why spices and cathartics are used so much more than at home. The diet must be well balanced. At first there is the temptation to overindulge in the fruits and carbohydrates. The candy box, the rich after dinner *dulce* and the starchy yam or yuca, all contribute to the carbohydrate poisoning which is so common in the tropics. An excessive meat diet is apt to cause a putrefactive process in the intestinal canal and thus produce toxemia and chronic ill health. The menu must be varied. After the stomach has been offended day after day by the same old tinned asparagus and the inevitable canned peach, it is rather likely to put on its war bonnet, leave the reservation, and begin the slaughter of the settlers.

ALCOHOL IN THE TROPICS.

Alcohol must be taken only in extreme moderation, and in the absence of daily exercise, never. Better still, it is best left strictly alone. The tropical steady drinker who does not exercise breaks up quickly. There is a certain lack of selfrestraint which characterizes all frontier places, especially the tropics, and thoughtless men and women let loose from the restrictions of the home environment sometimes do themselves great harm. Alcohol, slothfulness, and the lowering of personal standards are more responsible for the breakdowns which are commonly attributed to a tropical climate than any other combination of forces, with the possible exception of malaria. Unfortunately a good many North Americans are not as temperate as the representatives of a prohibition nation should be and they drink in a way which is harmful to themselves and shocking to the Latin Americans. They do themselves no good by their intemperance and they bring upon the nation the hurtful reproach that its citizens do not obey the spirit of their own laws. Occasionally in situations in which the water is bad, one must drink beer or wine or run the risk of contracting typhoid fever or dysentery, but usually safe bottled water can be obtained if one but looks for it.

EXERCISE.

Exercise in the open air is even more necessary in the tropics than in the temperate zone. The daily siesta, the easy chair, and the avoidance of walking are deadly in warm countries and a great many of the socalled tropical neurasthenias are largely the result of physical laziness. This is particularly true of women. Conversely, tennis and golf, particularly the latter, are tremendous health adjuvants in warm countries. Swimming, fishing, hunting, riding, and exploring, in fact anything which will get people to exercise in the open air, go a long ways to prevent those mental quirks which inevitably arise when a small isolated community of Nordics are absolutely dependent upon one another's society. The untanned man or woman in the tropics is headed for physical and perhaps moral disaster, and this is the more inexcusable in a climate where out of door exercise is pleasant the year around, where there are orchids and strange flowers to gather, ancient ruins to study and adventurous roads to travel.

VENTILATION AND PROTECTION AGAINST INSECTS.

Indoor comfort is largely a matter of ventilation and protection against insects. The house must be open to every breeze that blows yet it must be shaded but not too dark, and it must be kept absolutely clean. During the wet season clothing will mold easily unless kept in a dry closet. Even then it is wise to get things out into the sunshine every day or two. A good sized piece of camphor gum exposed in the closet helps to keep down mold. Good wire screening is a necessity, if one is to avoid man's ancient enemy, malaria, and there must be an unending warfare against ants and cockroaches. The house must be rat proof and rat free if one would keep plague away and there must be no mosquitoes breeding on the premises. Flies, of course, must be excluded, and the grounds surrounding the house kept clean. In selfdefense it is frequently necessary to take an active interest in the sanitation of the entire district or town and it is surprising how much a little intelligent effort will accomplish in improving the sanitation of a tropical environment. An American at San Juan del Sur, Nicaragua, drained the town and got rid of malaria, took the pigs off the streets and put them in clean rat proof pens and got rid of flies, beautified a public plaza and thus stimulated civic pride, all for less than a thousand dollars. An American consul at an important Central American seaport so stimulated public opinion that an efficient, full time sanitary inspector was employed, the garbage disposal, conservancy and streetcleaning of the town were improved, mosquito larva destroying minnows were maintained in all water containers, and what had previously been a most insanitary place was transformed into a safe and comfortable spot in which to dwell.

PROPHYLAXIS AGAINST TROPICAL DISEASES.

The person who sets out for the tropics without being protected against smallpox, typhoid and paratyphoid fevers and dysentery is assuming an unnecessary and very genuine risk. Smallpox is generally very mild among the native population which regards the disease with apathetic fatalism. Many of the larger cities have sewage and water mains which intercommunicate and their morbidity and mortality rates for the intestinal diseases are very high. Families resident therein are obliged to boil all drinking water. The stone filters so frequently seen in such places are an abomination and are only mentioned to be condemned.

ADAPTATION TO CONDITIONS.

After all, the Nordic who goes to the tropics must adapt himself to his new environment in exactly the same way that he would anywhere else in the world. He can do this if he will assume an intelligent forceful attitude, if he will take as many precautions to maintain his health as he would in any other place of the same sanitary condition. At first he will miss the stimulation of the society of people having the same hygienic ideals as he has, but if he is a person of character, he will not lower his standards and he will realize that by living up to them he may keep well in body, mind and soul. If he is a physical, mental or moral weakling, he had better never leave the sheltered environment of home. Such a person is pretty apt to get into harmful habits, to degenerate into the all too common beachcomber, and to become a disgrace to his race and country. If he is narrow and chauvinistic, or if he is that obnoxious type of American who is always telling people how much better we do things, he may be safe in health but he certainly will not add to the prestige of our country. The tropics need active, keen witted Nordics of character who can resist temptation and will keep themselves physically fit. For such there are ample rewards because they can adapt themselves to any environment, be it tropical or polar, but for the weak, the slothful, the stupid and the ignorant, failure is foredoomed.

PLAGUE PREVENTION MEASURES.

The Health Department of the Panama Canal is greatly concerned lest plague be introduced into Panama, the widespread prevalence of that disease in the seaports of the world making such a contingency possible unless every precaution be taken to prevent the introduction and breeding of rodents. A recent inspection of various storehouses in Panama City showed evidence of a large number of rats therein, and a circular has been issued outlining the plague preventive measures which will be put in force and requesting the cooperation of all residents in the expedition of this important work. All buildings undering repairs must be rat proofed in accordance with the sanitary regulations. In storehouses, warehouses, yards, patios, etc., that are used for storage purposes, all stored materials, foods and merchandise, boxes, barrels, crates, etc., must be placed on racks elevated from the floor at least eighteen inches and not over six feet in width. These racks must not be nearer one another than two feet and the spaces between them must be kept clear of material of every kind in order to make easier their inspection and the trapping of rats. The rat guarding of ships is being carefully continued and vessels are required to undergo fumigation prior to entering the drydock.

PERSONALS.

Dr. W. E. Deeks, of New York, the general manager of the medical division of the United Fruit Company, and Dr. Hunt, the president of the Island Medical Board of Jamaica, recently visited the Isthmus on a tour of inspection of the various ports of Central America and the northeast coast of South America. Dr. Deeks was for many years the chief of medical clinic of Ancon Hospital and several of his former coworkers gave a banquet in honor of him and Dr. Hunt at the Union Club of Panama, Dr. William James serving as toastmaster. *Hubo múltiplés Brindas.*

LONDON LETTER

(From our own correspondent)

London, *May 5, 1923.*

ENCEPHALITIS LETHARGICA.

The Medical Congress held recently in Vienna was productive of some valuable discussions. Perhaps the most remarkable report delivered was that of Professor Economo on encephalitis lethargica, termed in this country sleeping sickness and in Austria influenza of the head. As is well known, this disease was very prevalent in Europe during the war. As for its etiology, according to Economo, investigations showed the presence of certain bacteria in the brain; Doerr and Levaditi found that these bacteria were filterable and transmissible to the cornea of rabbits, where they produced symptoms similar to those obtained by infection with the contents of the ordinary herpes vesicles. It seemed likely that the etiology of herpes and that of encephalitis lethargica were identical, but in the latter disease the virulence was much greater for reasons still unknown. Transmission probably took place through the air, by way of the nasopharynx. A few contacts were infectious. Treatment against the encephalitic processes could be satisfactory in the early stages only. Intravenous infections of large doses of iodine gave good results in acute cases; chronic cases were still resistant to treatment. Between forty and fifty per cent. of patients die; and even in cases of recovery it was questionable whether the disease would not become chronic. The effects of this disease are of great interest to nerve specialists, as changes in personality, states of apathy, or, on the contrary, an intense desire for activity, are characteristic features of the condition.

Prof. M. Nonne, of Hamburg, read a second paper on this subject. He dealt chiefly with the clinical picture of the disease. While agreeing with Professor Economo with respect to the etiological factor, he suggested the possibility of a special neurotrophic toxin, similar to that found in metasyphilitic processes. The manifestations of chronic encephalitis could be placed in three groups: In the first, psychic symptoms were prevalent; in the second, the disturbances were centred in the organs of movement; and in the third, metabolism was chiefly affected. Often nothing was observed but a change in personality, without marked intellectual difference. The study of the pathology of this disease had greatly influenced current views as regards the diseases of the nervous system; it had given useful clues as to the function of the nucleus caudatus and nucleus lenticulatus, parts of the brain which controlled the voluntary innervation of single groups of muscles.

MENTAL SICKNESS.

According to a statement made by the medical correspondent of the London *Times* in a recent issue, Lord Onslow has introduced a bill into the British Parliament which aims at far reaching changes in the present system of dealing with insane persons and which makes provision for the temporary treatment of mental disorder without certification. It is laid down that local authorities may appoint as members of visiting committees persons who are not members of the council of the authority and that two at least of the members of every visiting committee shall be women. Subject to certain consents a visiting committee shall have the power to make agreements with other visiting committees, providing for joint exercise of powers; it shall be also able to provide or arrange for outpatient treatment of persons suffering from mental disorders, and to take as boarders voluntary patients who apply in writing, in the case of those under age, application to be made by parent or guardian. The committee is further empowered to make provision for the aftercare of persons discharged from mental hospitals and to undertake, subject to the approval of the board of control, research work in mental diseases. Regulations governing the acceptance without certification of patients likely to benefit by temporary treatment in an institution are a prominent feature of the bill. The period of such acceptance without a receiving order is fixed at six months, but may be extended to a year.

Recommendations for treatment shall not be given, however, except in respect of a person who either is willing to submit to treatment, or is incapable of volition, or in whose case, if he is a minor, consent has been given by parent or guardian. Every application must state under which of these categories the patient comes. The board of control is given powers to "approve" unregistered hospitals, or any part of them for the purposes of this treatment, which may also be given in any registered hospital, institution or licensed house, under the control of a visiting committee. Recommendations for treatment must be given by two medical practitioners, of whom one shall be a person approved by the board or the local authority. Persons received for treatment as boarders or patients may, 1, leave at any time after giving forty-eight hours' notice; or 2, be discharged by the medical superintendent or by order of a commissioner or by any person who would be entitled to direct his discharge if he were a private patient detained in an institution for lunatics. In the case of a minor, notice of intention to leave shall be given by parent or guardian. This new departure in the methods of treating the mentally sick is in keeping with the most recent conception of mental disorder, that is, treatment by specialists in the early stages so as to prevent the disorder from developing. Up to the present the laws regulating the treatment and control of lunatics were such that no special treatment was available for those with moderate means, except they allowed themselves or their parents or guardians allowed them to be incarcerated in a lunatic asylum. If the bill passes a new era in the treatment of the mentally sick in Great Britain will set in.

PANEL DOCTORS' PAY.

The annual conference of the Association of Approved Societies has just been held, when the question of the remuneration of medical men practising under the insurance act was discussed. The chairman said there had been talk of a doctors' strike, though the doctors resented the word strike. The doctors on the whole had rendered wholehearted service, but there was also a good deal of nonsense talked about doctors' selfsacrifice. Doctors were not the only selfsacrificing profession. They, like others, had adopted their profession to obtain a livelihood. They had a right to combine to get results, but those who were to pay the doctors were also entitled to be consulted with regard to the terms. Approved societies had considered the question of extending the medical service and Sir Alfred Mond, the late Minister of Health, had lent his weight to the idea, put forward some years ago, that medical service should be reorganized on a family basis. This had been described as a state medical service. If they had to pay anything like the sum the doctors desired, they might as well go the whole length and pay for state medical service. The matter of medical men's service under the insurance act seems as if it were approaching a crisis. The Approved Societies, who have contributed towards the remuneration of the medical men, do not appear to be inclined to continue to do so unless they are given a dominant voice as to the manner in which the medical men should conduct their practice. Probably the question will be threshed out before long.

DEATH OF SIR SHIRLEY MURPHY.

A great public health officer, a pioneer in some directions, passed away on April 27th last, full of years and honors. Shirley Foster Murphy was born on May 21, 1848, in London. He was educated at University College School and Guy's Hospital. His medical interests were confined mainly to epidemiology and prevention and after a good deal of experience of these questions he obtained the appointment of medical officer of health of St. Pancras, one of the largest of the London boroughs. Reactionary opposition was so strong that Murphy, despairing of making progress, resigned in 1884 and adopted the bold policy of setting up as a consultant in public health, in the quarter of London in which specialists mostly congregate. When the London County Council was formed Murphy secured the appointment under this body of the first medical officer of health of the County of London, which he held for twenty-two years. In this position Murphy did great work, aided by his able staff, and especially by Dr. Hamer and Dr. Young. A knighthood was conferred upon him in 1904, the Royal College of Surgeons granted him the honorary fellowship and the Royal College of Physicians the Bissett Hawkins medal in 1908. He retired in 1911. As soon as war broke out he volunteered for duty, was made a Lieut. Colonel R. A. M. C., on the Territorial list for special sanitary service, and was attached to the London Command. In 1919, in recognition of these services, he was created K. B. E., and in the same year represented the British Government at the congresses of the American Medical Association and the Ontario Medical Association. In 1921 he was nominated by the Minister of Health as one of the managers of the Metropolitan Asylum Board. Although of a shy and retiring disposition he had many friends in almost all classes of society. Among many other distinctions he was awarded the Jenner medal by the Royal Society of Medicine.

Book Reviews

DENTAL RADIOGRAMS

Dental and Oral Radiography. By JAMES DAVID MCCOY, M.S., D.D.S., F.A.C.D. With 116 illustrations. Third Edition. St. Louis: C. V. Mosby Company, 1922.

Dr. McCoy includes in his textbook a consideration of both the technical aspects that enter into the production of the radiogram and the diagnostic value or interpretive aspects. The material is well grounded and well ordered and should serve the purpose intended by the author, namely, to produce a textbook for students and practitioners. Dr. McCoy would have been interested in the new technic for controlling the central ray in a predetermined angulation, as outlined by Dr. J. F. Freund in this issue of the NEW YORK MEDICAL JOURNAL.

The author utters a proper word of caution concerning the use of the radiograph only as a diagnostic aid in connection with clinical evidence.

ULTRAVIOLET RAYS IN DENTISTRY

Ultraviolet Energy in Dentistry. By A. J. PACINI. Chicago: Victor X Ray Corporation, 1923.

According to Dr. Pacini abscesses, acute and chronic, antrum empyema, caries, fistulæ, fractures, gingivitis, cellulitis, necrosis, and osteomyelitis can be cured by the use of ultraviolet energy. The pathological conditions mentioned above are only a few of those enumerated by Dr. Pacini. Curiously enough he promises no cure for pyorrhea alveolaris, nor does he assure the sterilization of root canals with ultraviolet energy. It is also interesting to note that the use of this energy is suggested only as an adjunct to surgical procedures. We wonder whether Dr. Pacini is aware that what he is actually contending is that the ultraviolet energy should be used only when and where surgical intervention has already effected a cure.

THE BUCCAL CAVITY

Diseases of the Gums and Oral Mucous Membrane. By Sir Kenneth Goadby, K.B.E., M.R.C.S., L.R.C.P., D.P.H. London: Henry Frowde and Hodder & Stoughton, 1923.

The literature regarding clinical pathology of the tissues within the buccal cavity has been scanty and unorganized. Within the last year two books have made their appearance. Stillman and McCall's *Clinical Periodontia* was reviewed in these columns some time ago. This book dealt largely with diseases of the tissues surrounding the teeth, the etiology of which was local. The scope of Goadby's work is much broader. The book may be divided into two sections: the pathology of oral tissues of local origin, and the pathology of oral tissues incident to and symptomatic of systemic disease.

Little variance can be noted in the handling of the same subject by the two authors. Both are keen observers, and Sir Kenneth, like Dr. Stillman, takes exception to the use of the term pyorrhea alveolaris to designate a disease of many stages ranging in its incipiency from a mild gingivitis to the production of pus only in its late or final stages. The second part of the book, dealing with the pathology of the tissues in the buccal cavity incident to and symptomatic of systemic disease, is especially interesting to the members of the dental profession. It offers a splendid opportunity to become familiar with the clinical evidences of diseases such as syphilis, as an aid to diagnosis. The book is scholarly throughout and detailed in its descriptions. There are occasional colored plates—all intended to portray vividly the clinical picture of the disease to the general practitioner. The publishers deserve a word of praise for the production of this book.

DISEASES OF THE DIGESTIVE TRACT

Krankheiten des Verdsunngskanals (Oesophagus, Magen, Darm). Von Dr. Paul Cohnheim. Berlin: Verlag von S. Karger, 1923.

The fourth edition of Cohnheim's excellent monograph on diseases of the digestive tract is both precise and practical. In the treatment of appendicitis Cohnheim advises the following: Treat conservatively, i. e., medically, typhlitis and simple appendicitis; operate in the acute stage in perforation and gangrenous appendicitis; operate in the interval in recurrent appendicitis and in appendicitis lavata (Ewald), if there are sufficient symptoms to justify such a procedure.

The diagnosis of intestinal ulcers is based on the presence of pus and small particles of tissue (mucosa) in the stool. Blood in the stool is also of importance. Watery evacuations, however, are not sufficient for the diagnosis of intestinal ulcers. In an acute attack of diarrhea Cohnheim recommends calomel, four grains, two doses in an interval of two hours; two hours later give a dose of castor oil. For a few days, give the patient no nourishment except weak tea. Opium should not be given.

ANESTHESIA

Anesthetics in Practice and Theory. A Textbook for Practitioners and Students. By J. Blomfield, O.B.E., M.D. (Cantab.) Chicago: Chicago Medical Book Co., 1923.

This eminently practical book deserves a welcome in spite of the fact that numerous books on the subject have been published recently. It is a valuable aid to any one who desires to perfect himself in the science and art of anesthesia. Adequate attention is given to both experimental and practical (physiological and surgical) aspects of the subject. The author emphasizes the fact that the anesthetic and the method of its administration must be suited to the individual patient, to his disease, and to the type of the operation perfomed. The physical and chemical nature and the physiological action of general anesthetics are discussed.

A special chapter is devoted to those anesthetics that are less commonly used, such as amylene, pental, amyl chloride, butyl chloride, bromoform, carbon dioxide, carbon tetrachloride, chloral, ethyl bromide, ethidene dichloride, hedonal, hydramyle, isopral, methyl oxide, magnesium sulphate, nitrogen, hypnotism, hypnonarcosis, acetone, benzene, ethyl nitrate and turpentine and the electric current. On the whole, chloroform is looked upon with ill favor in America, but the author, as do most European anesthetists, believes that chloroform still deserves to be used in certain cases, particularly the chloroform ether mixture. The various anesthesia apparatus, all of the English type, are accurately described. The preliminary use of narcotics is given full consideration. The etiology and treatment of undesirable conditions, accidents and complications arising during and after anesthesia are studied.

The unusual uses of anesthesia is a subject usually not given consideration in textbooks but is given ample consideration here. The various technics and solutions used in local analgesia are also included, as well as the subjects of spinal and sacral analgesia. A special chapter is devoted to the fatalities of anesthesia. Anesthesia in obstetrics, including the subject of hypnosis is discussed. The citations from the literature are numerous and quite recent and give due credit to American and Continental authors. This book is a valuable addition to the literature on anesthesia.

THE TUBERCULOSIS WORKER

The Tuberculosis Worker. A Handbook on Methods and Programs of Tuberculosis Work. By Philip P. Jacobs, Ph.D. Baltimore: Williams & Wilkins Company, 1923.

This is a unique book, perhaps the first one of its kind in existence, written by a man who, as a layman, has doubtless had a larger experience with tuberculosis as a social disease than any other man. Although the book contains only about three hundred pages, it contains a vast amount of information essential to all who would wish to be efficient in the solution of the many problems which confront the layman or woman who has joined the ranks of tuberculosis workers.

To give a fair idea of the interesting way in which the subject is presented, it may be well to enumerate the nineteen chapters of Part One, in which the respective subjects are treated with brevity and clarity: 1, The health salesman; 2, exhibits; 3, newspaper publicity; 4, the printed word; 5, the modern health crusade; 6, the spoken word; 7, motion pictures; 8, other educational methods; 9, organization methods; 10, clinical methods; 11, medical service; 12, nursing methods; 13, industrial methods; 14, open air schools and preventoria; 15, institutional methods; 16, survey and statistical methods; 17, financial methods; 18, financial methods concluded; 19, cooperation with public officials.

In chapter I the author defines the tuberculosis secretary as one who is in a real sense a salesman, who goes into the community and seeks to arouse a sufficient amount of interest and enthusiasm to secure the necessary machinery for the control of tuberculosis. The machinery consists of men, women, children, institutions, and money. To get these he must sell an idea, namely, that health is a profitable and paying individual and community investment. I am sure that under men and women the author includes the physicians of both sexes, although he fails to emphasize this point.

In chapter VIII, under the heading Other Educational Health Methods, Dr. Jacobs mentions the experience with the health clown, which proved so efficient in interesting school children in health methods, and describes parades, baseball games, pageants and plays, marionettes and toy theatres as helpful in arousing the interest of adults and children and urge them to coöperate. Most instructive is chapter XIV, devoted to open air schools and preventoria. In this chapter it is interesting to note the divisions of open air schools into three kinds; first, the school for the typical tuberculous child; second, for the predisposed or pretuberculous child; and lastly, for the normal child. The selection of cases for such schools and their equipments is dealt with in detail. Equally instructive is the succeeding chapter on institutional methods which deals with the planning of special hospitals and sanatoria. Under Cooperation with Public Officials it is emphatically stated that the campaign against tuberculosis is part of the great public health movement and should always be so considered. The broader campaign implies a recognition of the official aspects of community life as well as of the unofficial aspects. It implies further, that the tuberculosis movement must of necessity coöperate with public agencies—city, county, state, and federal.

Part Two of the book is devoted to methods in their definite relation to programs for local, state, and national work. These programs give an excellent idea how urban, rural and state committees should proceed in their antituberculosis campaign. The celebrated Framingham program is given in full and for its well known results it deserves the widest emulation. Each of the twenty-six chapters of the book is followed by selected references to articles, constituting a veritable bibliography which may be consulted for additional information. Thus the volume offers not only to the lay workers but also to the physicians interested in the tuberculosis problem a mine of information difficult to obtain elsewhere. The author is to be congratulated on having accomplished a difficult task and on presenting so useful a book to medical and lay workers for their guidance in carrying the prevention of tuberculosis to the people. Dr. Jacobs's book will be one of the most effectual means to bring about an ultimate eradication of tuberculosis as a disease of the masses. It should be in the hands of every one interested in the solution of the tuberculosis problem and the health and welfare of the people at large.

FRACTURES AND DISEASED JOINTS

The Ambulatory Treatment of Fractures and Diseased Joints. By C. A. Hoefftcke. With an Introduction by Frank Romer, M.R.C.S., L.R.C.P., and articles by many Eminent Surgeons and Physicians. With numerous Illustrations. London: William Heinemann, Ltd., 1923.

Views as to the most effective mode of treating fractures and diseased joints have changed greatly within recent years. It used to be an article of faith with surgeons and medical men generally that complete rest was the essential treatment in such cases, and to advocate movement, at any rate in the early stage, would be sinning against the laws of nature. The great British surgeon Hugh Owen Thomas in 1878 laughed to scorn the extension principle which, by the way, was introduced and employed in America, to some extent, before 1878, and Hoefftcke's ambulatory extension splints have been used in Great Britain during the past twenty years for diseases of the joints and fractures. One of the essential points concerning which the experiences of the recent war have apparently resulted in a more or less complete agreement, is the rule that continuous extension, in a general way, is to be preferred to immobilization. In fact, this was one of the chief lessons learned in the war.

Willems, the well known Belgian surgeon, was the most enthusiastic exponent and protagonist of treatment by spontaneous immobilization of suppurating joints and it may be stated without exaggeration that the results have marked a new epoch in treatment. Not only Willems, but surgeons and general practitioners of every nationality, have become convinced of the ill effects of long continued immobilization and many who have practised this method of treatment for years have seen fit to revise their opinions. As Mr. Frank Romer says in the introduction to the book which is being discussed, "It would appear, as Sir Arbuthnot Lane points out, that provided the articular surfaces are prevented from impacting forcibly on one another by sufficient extension, that many diseased joints can be safely and advantageously kept in functional use," and this statement expresses the views of authorities on the subject everywhere. For this purpose Hoefftcke's splint is specially designed and the list of cases enumerated in the book seem amply to demonstrate its value.

Moreover, it is stated that this form of treatment has been followed by great success in cases of arthritic origin, a type of disease unduly prevalent at the present time, which, as well as being one of the most painful and crippling diseases known, is one of the most difficult to relieve or treat successfully in any way.

Mr. Hoefftcke's book provides a full and clear description of his methods of treatment and of the appliances by which this treatment is carried out, while the use of the appliances is explained or rendered more easy of comprehension by means of a large number of graphic illustrations. Many of the best known surgeons of Great Britain have written favorably of Hoefftcke's methods and John Fairbairn Binnie, of Kansas City, in his treatise on regional surgery refers to Hoefftcke's splint in high terms.

The book is well written and shows what the extension principle of fractures and diseased joints is and the results its skilful application can achieve and as an exposition of the ambutatory treatment of such conditions is excellent in every respect.

INDUSTRIAL EDUCATION

Education and Industry. By Henry C. Link, Ph.D. New York: Macmillan Co., 1923.

The author's point of view is practical and experimental rather than theoretical and constructive. He anticipates critics of his book, who will say that it is lacking in constructive theories, by stating in his preface that he believes that "an orderly and successful attempt to make things what they should be is impossible without an appreciation and command of things as they are." Since the changes in the social and economic structure of the times are largely the results of an unprecedented industrial development, the centre of interest in the field of education today is undoubtedly the subject of the relation between education and industry. It is impossible to have so radical a change in the elements of a civilization without having a reflection of that change in the elements of its educational system, and without a considerable transformation in its educational methods.

He concerns himself in his book solely with a consideration of the outstanding and most promising manifestations of this change, his opinions and observations being based upon his work for the past several years as educational director for two large industrial corporations. The conclusion reached by him is that the efforts made in the field of industrial education will continue to fall wide of the mark unless they are based upon adequate information about the characteristics of industrial life. Such information may be obtained through vocational surveys such as have been made in a few of the States. At present numerous difficulties lie in the path of making such surveys; fundamental to solving these difficulties is a better general understanding of the common needs of education and industry. The book indicates the methods by which industries and public educators may cooperate to best advantage. Such cooperation will gradually provide the background of knowledge upon which future plans for industrial education may be most substantially built.

Chapters of special interest are those on industrial motion pictures, propaganda as an economic force, and subnormal workers in industry.

PSYCHOLOGY IN THE NOVEL

The Fruit of the Tree. By Hamilton Fyfe. New York: Thomas Seltzer, 1922.

In this novel some interesting psychological determinants are brought into play, and the story unwinds its usual unusual theme ending in the cowardly impasse of countless marital situations.

Muriel, the heroine, is the oldest of infinite children. Her mother dies of the last child, having sacrificed her life and all her hopes of personality for the bearing of children. The father suicides, unable to exist without the eternal mother. He disappears off a boat; plunging again into his prenatal medium.

On nothing a year Muriel goes to London to study law. She is going to make up to her mother for the dreams that were blighted by children. She does not want children. She drifts along, women friends, work here and there, finally some clerical work for a man who falls in love with her. After long debate they marry. Muriel in a flurry of casualness indicates that she is not interested in childbearing, but the lover does not understand and is bitterly disillusioned after marriage. Mentally they are good partners. Physically Muriel apparently does not exist. After her marriage she stops her studies, keeps her husband's house and helps him with his work, and amuses herself. All through the book she seems a singularly half baked individual, scintillating with charm when charm is required but in every other respect mentally and spiritually anesthetic. Needless to say her husband seeks and finds another outlet, a matronly animal who having got the children she longed for is content with them.

Then comes the dreaded, inevitable moment of discovery. The husband is in a bad way all round. Socially Muriel satisfies him; domestically for a time. Margaret, the mother of his children, satisfies him. A divorce means ruin for him socially, and more important to Muriel, the loss of a comfortable home and an income. Margaret doesn't care to give up the management of her children to their father. She can do without him perfectly well. Muriel does not want to give up the management of her home and her husband's incidental business affairs, especially the more important legal duties which will be coming his way. She also can do without him personally perfectly well.

And so the story ends, in an immoral, unproductive tangle. Clearly Muriel needs to have radical measures used on her to educate her out of the prostitute complex into which she has fallen. And her husband also needs to overcome the mother dependency that pictures to Muriel's unconscious the psychic configuration of her own father.

As the story now stands it gets nowhere. It is a tissue of contradictions, muddled thinking, yet arrives at a very frequent state of affairs in every day life. But the author accepts and leaves things. He sheers away from the task of making something of these commonplace mortals that might leave them a little less earthy than he found them.

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Medicoliterary Notes.

The Provincial Board of Health of Ontario has hit upon a unique way of helping to disseminate information about personal and public health. This is through the publication of a *Health Almanac.* The foreword states that this almanac is "dedicated to those who enjoy being well. Various phases of the work of safeguarding the health of the community and of the nation have been touched upon, so that those who read may realize that the subject is as complex as life itself." The pamphlet includes a monthly calendar giving the most important scientific or historical event of each day, with health maxims for days not especially significant historically. Popular paragraphs and articles on health matters are interposed between the calendars.

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Rhus Dermatitis (Poison Ivy); Its Pathology and Chemotherapy, by James B. McNair, has been announced as one of the forthcoming publications of the University of Chicago Press. The discussion of the subject is very full and includes investigations from the pharmacological, botanical, chemical, and therapeutic viewpoints.

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Current History for July contains an article by Clyde Langston Eddy entitled One Million Drug Addicts in the United States.

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The summer play schools, which opened July 9th and which will be in operation until the end of August, have been an unqualified success. They include health instruction for the children in attendance, a canteen under the direction of a dietitian, and occasional trips to the country and to museums.

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L'Anima della Donna is the Italian title of the book recently published in this country by Dutton under the title *The Soul of Woman.* The author is Gina Lombroso, who is a daughter of Césare Lombroso, the well known criminologist. The keynote of the woman problem, according to the author, is woman's realization that the distinction between sexes has been and always will be an insuperable obstacle to equality of the sexes in the day's work, and that she might as well make up her mind to accept things as they are and settle down to the home and children. Strange to say, Gina Lombroso, who is the wife of the famous historian, Ferrero, seems, in spite of her antifeminist attitude, to feel it perfectly fitting that she be known as a writer by her maiden name only, to qualify for the degrees of Doctor of Laws and of Medicine, and to take an active part in many economic and sociological movements and reforms.

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Prof. Stuart P. Sherman, of the University of Illinois, has an interesting and entertaining article in the July *Atlantic Monthly,* on literary censorship. To "make the world safe for children and adolescents," he says, is a beautiful and inspiring thought, but it can't be done. Both the would be censors and some authors are in part in the wrong, but the solution of the problem is certainly over the heads of the police.

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The National Committee for Mental Hygiene is making a study of the facilities in the public schools of this country for the training of mentally handicapped children. A questionnaire has been sent to supervisors of special classes and to superintendents of schools generally, to ascertain where special classes are in operation, how many children are examined and selected for these classes, the training they receive, the qualifications of their teachers, the supervision out of school hours, and what this training is accomplishing in the community. The replies received are now being analyzed, and the results of the study will be published for distribution.—*Mental Hygiene Bulletin.*

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Since the war the British Isles have been using for food large quantities of eggs imported from China. Condensed egg powder was made from the yolks and the dried egg albumen preserved with acids. The Ministry of Health has decided that the cooked foods in which these substances were used are harmful and their sale for consumption has been forbidden under the food and drugs act.

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The legislature of North Carolina has authorized the removal of the criminal insane from the state prison to the state hospital. A new building is to be constructed for the latter institution at Raleigh for the care and treatment of these cases.

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Two interesting articles in the July *Atlantic Monthly* are The Physiologist in Industry, by Frederick S. Lee, and Progressivism, Old and New, by Charles Merz.

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Announcement has been made that Dr. Charles K. Clarke, of Toronto, has had the honor of being chosen to deliver the Maudsley lecture for 1923 before the Medico-Psychological Association of Great Britain and Ireland. This lectureship was established upon a fund left by will by Dr. Henry Maudsley to the association. Only three lectures have thus far been given since Doctor Maudsley's death. The lectures were Sir J. Crichton Browne, Sir F. W. Mott and Sir Maurice Craig.

Practical Therapeutics

ORAL SEPSIS IN CHILDREN

By Henry S. Dunning, M. D., D. D. S.,
New York.

Volumes have been written during the past few years on oral sepsis and its relation to health and disease. The medical and dental professions are acutely alive to the importance of this subject. It is not for me, at this late date, to try to convince anybody that all chronic septic conditions are a serious menace. Hunter, Billings, Black, Hartzell, Colyer and a host of others have called attention to the rôle that oral infection plays in the human scheme of things. These writers have proved beyond much doubt that the mouth is a part of the human organism and that there is a close relationship between buccal infections and systemic disease. My only purpose in presenting this time worn subject is to plead for the children; to endeavor to arouse the medical profession to a greater interest in helping children grow unhandicapped into healthy and useful citizens. Are we doing all we can to lift the burden of sepsis from their young shoulders? Are we helping to carry their load, until they can carry it themselves? What are our hospitals doing?

The mouth is the most unclean cavity, bacteriologically, with which we have to deal. It harbors over one hundred different varieties of bacteria and is subjected to greater trauma than any other region. Thermal changes, in the form of food, hard and soft; medical agents; mechanical abrasion; poor dentistry, give the ever present bacteria plenty to do. On account of the conditions mentioned above, the buccal tissues, including the maxillary bones and mandible, often become infected. There are, generally speaking, three methods in which infections may enter the deep tissues of the jaws: First, the pericemental route, beneath the gingival flap; second, the intradental, within the tooth, through the dental nerve, or pulp canal; third, the hematogenous. The first two avenues are increased by the number of teeth present. In other words, the more teeth an individual has the more susceptible he is to oral sepsis for he has a greater line of defense to keep in repair. He has a larger area of gingival membrane to keep healthy and he has more dental nerves or pulps that must be *kept vital.*

It is more difficult for the child to keep up his first line of defense against the enemy, infection, than the adult. The resistance, as a rule, is not so good, and in the mouth the dental organs are in the developmental stage, with many irregularities that provide comfortable living quarters for bacteria. For this reason the average child finds it hard to keep his mouth clean. He is handicapped. The adult may appreciate the importance of oral hygiene; the child does not. The adult can often visit a dentist; the child can, too, at times, but does he receive the proper treatment that he requires? This last question I shall try to answer later. For the reasons given above, oral sepsis in the child is most common.

St. John Steadman (1) states that eighty per cent. of all children suffer from oral sepsis, that it is the most common of all chronic diseases. He also believes that chronic disease in the child, the effects of which spread over a period of years, must have a profound influence on its mental and physical growth, and he shows that many systemic disorders are traceable to oral sepsis. He calls attention to the fact that anemia, general mental and physical deterioration and loss of weight are due to unclean mouths. Colyer, in 1910, I believe, was the first to weigh children before and after the removal of infected teeth. He found that there was frequently a marked increase in the weight of a child after extraction and that this increase was too great to be ascribed to normal increase due to the growth of the patient. Rapid increase of weight does not always occur after the removal of the diseased teeth, as there may be other foci of infection that would have the same effect as infected teeth. He explains the loss of weight by the fact that children do not sleep well when dental irritation or pain is present. He has many charts and case histories to show rapid increase in weight upon the extraction of septic teeth. He also says that proper mastication is lost, as the child will not use tender, painful, infected teeth, and either refuses much of his food or swallows it before it has been properly masticated. The dental condition has often interfered with the sleep of the child for months unless the mother is observant, for the child does not always complain. Colyer further explains the loss of weight by the fact that infected teeth cause gastrointestinal disturbances, the main symptoms of which are gastric pain and diarrhea of an offensive character. He also cites fretfulness, night terrors and loss of appetite, which result in marked pallor of the face. He says: “If you take thirty children arranged in three groups, ten with all their teeth present and both teeth and mouth perfectly healthy; ten with most, or all, of their teeth removed but their mouths otherwise healthy, and the remaining ten with septic teeth and inflamed mucous membranes, it will be easy for the trained eye, aided, if you like, by the scales, to pick out the third group of children, but it will not be possible to separate the other two.” He goes on to say that the average physician is apt to treat the patient for gastrointestinal troubles first without paying much attention to the patient’s mouth. He cites the case of a child who was treated for gastritis for eleven months by a physician who disregarded the fact that the little patient had two badly abscessed molars. The gastritis cleared up shortly after their extraction.

Dr. H. Walker calls attention to the effect of dental disease in nursing women. He says that in many instances the infant loses weight when the mother has septic teeth. He goes into this question in detail and has about two hundred charts of cases showing that the infants generally gain weight upon the extraction of the mother’s septic teeth. Dr. Walker says also that it is important to see that there is no septic material in the child’s food and this can be done to a great extent by giving him a clean mouth.

Billings says, “The focus of infection which undoubtedly causes the streptococcus viridans bacteriemia and chronic malignant endocarditis is often from an alveolar abscess. Of this we have had numerous clinical examples. Coincident cultures from the alveolar abscess and the blood have yielded strains of the streptococcus viridans. When these nascent cultures were injected intravenously into animals, typical endocardial lesions have resulted. Billings says, further, that the deeper the infection is seated in the tissue and the greater the pressure of the accumulative bacterial products, the larger the amount of absorption. The tissue in which the infection occurs is also important. Mucous membranes absorb easily. An abscess enclosed by bone gives little chance for infiltration or extension; therefore, the pressure is great and the bacterial products are absorbed readily.

On account of the fact that most deep dental apical infections are locked in the spongy vascular bone where there is poor drainage, I feel that dental infections often do more harm than infections of the tonsils, as the latter drain more freely. If there is a sinus, the pressure is decreased and the amount of absorption is diminished. When abscesses or other lesions discharge their exudates into the mouth, they reach different parts of the alimentary canal where a new focus may be formed, especially if the pus supply is long continued, but secondary lesions may in turn also become foci for further and more general infection. Such conditions must not be mistaken for primary causes, but should be removed so as not to prolong and intensify focal disease.

We may also have other conditions, such as pharyngitis, otitis media and meningitis, formed through continuity of tissue. Some clinicians do not pay much attention to swollen submaxillary glands in children. Chronically swollen glands are a distinct detriment to the child. Such glands often remain large for a long time, become tender readily, and do not function as well as normal glands. Such glands are a handicap to the patient and these damaged organs are likely to break down at a later date if untreated. We should find out from whence the infection comes and remove its source, whether it be in the tonsils, the teeth or elsewhere; they often come from the teeth. Lymph drainage of the teeth and jaws is important.

Cleanliness will prevent oral sepsis, but cleanliness in the average child is a hard thing to obtain and to maintain. Many children have a bad start as regards their teeth. Many mothers wash their children's hands oftener in one day than they do their teeth in a week, and I believe that dirty hands are less dangerous than a dirty mouth. It is a tedious and irksome procedure to clean the teeth of children; to obtain the best results, one must make a sort of game of it and the parent must at times offer prizes for the cleanest teeth each week. The child must become familiar with the toothbrush almost as soon as the first teeth appear. The parents must see to it that the teeth are brushed carefully twice a day at least, and it is dangerous to leave it to the nursemaid, however trustworthy she may be. At an early age, say three to four years, the child should be introduced to another nurse who, we hope, is going to reduce the amount of oral sepsis by one half. The nurse I have reference to is the dental nurse, the majority of whom clean teeth much better than the average dentist and can handle these little tots more easily than can mere man. Children should be taken to the dental nurse or the oral hygienist twice a year and if this habit is started early they become so accustomed to the appearance of a dental office that it never holds any terrors for them. They think it's a great joke, if they are handled properly and are not hurt, and there is no reason for giving pain.

Many believe that pyorrhea can be prevented absolutely if the patient receives early and regular treatment at proper intervals all their lives, and that dental caries can be prevented to a very great extent. It should be our endeavor to prevent dental nerves or pulps ever becoming infected. We should not allow teeth to become nonvital, for as yet a vital tooth does not enter into the pathology of the mouth. We can prevent all these conditions in the children of the rich. It is being done every day. But what is being done for the poor? What kind of dentistry does a poor child in a large family get? He gets no preventive treatment, and is lucky if he gets to a clinic in time for extractions before he is in pain, and he is also fortunate if, when he gets there he receives the proper treatment in a way that does not strike terror to his poor little soul and make the operator forever his enemy. We need clinics and more clinics for children. We have no Forsythe and our George Eastman clinics in New York. What are our hospitals doing for the child's oral conditions? Almost nothing. There should be large clinics in this city where poor children could receive prophylatic treatment and I believe that every modern hospital should have an adequate dental staff to care for the mouths of children in order to prevent the distressing conditions which now exist. The public schools and the Red Cross are doing something to help the children, but as yet I am afraid that we have hardly scratched the surface of the problem.

It will take many years, I fear, to provide for the proper preventive treatment for poor children in this country and, for that matter, in any country. I am afraid that few of us will live to see this accomplished. Our chief problem is what to do *now* to help the child. The treatment of these conditions is surgical. It takes considerable courage to condemn many teeth in a child and I believe that most dentists lack this courage to a great extent. There is poor cooperation in this direction between the dentist and the physician. The physician sometimes orders teeth to be extracted and cannot get the dentist to perform the operation. He wants to wait until the "swelling goes down." It happens also that the physician tells the dentist to wait until the child "gets better." Neither are anxious at times to take the responsibility, and between the two there is nothing done until the infection has gained considerable headway and a good deal of damage has been done. A virulent tooth infection can cause a good deal of destruction in a short time. I believe all deciduous or permanent teeth whose nerves or pulps are exposed should be extracted *on sight,* the wound curetted if necessary, and the infected alveolar process treated and watched as any other surgical wound would be cared for. Dr. William L. Shearer says that not enough thought has been given to the surgical principles involved in certain pathological problems of the mouth. Surgical technic has been sadly neglected. Much has been done without sufficient knowledge of the pathological condition present. He also says that, where extractions have been numerous and the curettments extensive, the postoperative systemic conditions are at times alarming, and the tooth sockets drained for days and weeks with foul discharge, which oozed from the reddened inflamed gums, and responded slowly to any form of treatment. In addition to the local disturbance, systemic reactions frequently occur which are manifested by chills, fever and lassitude which would last for days. Increase in leucocyte count is common. I might say here that few men today believe in the extraction of many teeth at one time, the systemic postoperative reaction is often severe, but is not as severe in children as in adults.

Great good will result from our cooperative work when we understand better the pathology of the mouth and more surgical principles are employed. We have been content often with the mere extraction of diseased teeth; in many cases this is not enough. Radiographs taken later often show failure in our efforts to remove disease. Osteitis and granuloma often exist years after careless extractions and these often tend toward cyst formation.

The pediatrist should be able to check up mouth conditions and should be helped by the dental surgeon in their eradication. He should be able to recognize an inflamed gingiva and to express pus thereof as well as he is able to examine an ear. He should be able to test for vitality in a tooth and to read a dental film. We need extracting clinics in hospitals where fifty children a day can be cleaned up if necessary, surgically. We need intelligent young dental surgeons attached to the children's services in our hospitals, who will make rounds in the wards with the physician and who is not afraid to extract teeth. Prompt attention is necessary. I heard recently of an instance where in one of our best hospitals a call was sent for the dentist, who was attached to the hospital, to see a little patient with chorea. This patient was not seen by the dentist until seven weeks after he was notified. They say, "Save all the first teeth or else the jaw will be deformed and the permanent teeth will not erupt properly." I believe this theory has been proved wrong to a great extent.

Children as a rule take gas poorly and few approve of this anesthetic for very young children. I believe the open mask with ethyl chloride spray or ether with the tin mask is the best. Less nausea and vomiting will result if the anesthetist is particular about the amount of anesthetic used and frequently the patient can be sent home in an hour or two. Deciduous teeth sometime infect the permanent and great care must be taken to get good drainage for the erupting second teeth and to drain the surrounding bone and soft tissues. Care should be taken in extracting the first teeth not to injure the second teeth just below or just above, as the case may be. In closing, I wish to make a plea for a great dental infirmary for children in this city on the lines of the Eastman and the Forsythe clinics, where all kinds of preventive treatment can be given for these mouth conditions, where thousands of infected teeth can be extracted, quickly, cleanly, painlessly, and, in fact, surgically.

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Letters to the Editor.

ETIOLOGY OF ULCER

To the Editor: New York, *June 7, 1923.*

It was with much interest I read the clinical observations on Peptic Ulcer by E. Palier, New York Medical Journal, June 6, 1923. Of especial interest was Palier's argument on the etiology of ulcer, based on his bedside and office observations. I would like to have obtained his protocols for his belief that microorganisms do not play a rôle in the etiology of ulcer.

Since my first observations on ulcer when in Virchow's laboratory in 1892 during the cholera epidemic to the present time, I have been impressed with the fact that infection plays no direct rôle in peptic ulcer and have so stated in my numerous publications on the subject. Ulcer conditions arising in infections, are not due to microorganisms but to tissue autolysis which I have shown occurs the same in the absence of infection. My experiments and deductions in nearly a hundred publications verify this. I regret that Palier did not read my protocols correctly, and the deductions made therefrom. In some of my experiments it was stated that beef extract was added to the regular rations of animals and in others, tannic acid and other agents. These agents interfered with normal digestion, absorption and assimilation. This induced general autolysis to provide for the induced caloric deficit. Then acute and chronic peptic ulcers were thus induced. In other animals, culture of Bacillus coli were added with the beef extract, but it was clearly stated the cultures did not cause infection but a condition in the alimentary tract that made autolysis necessary to supply the caloric deficit.

As I stated (*Journal A. M. A.*, June 9, 1906), "It is no less evident to one investigating the problem of the production and persistence of gastric ulcer, that we have here not a question of local pathology, but of general blood pathology of complement and amboceptor of cystolysis and autolysis," and summarized as follows: "Cystolysis and autocystolysis of the cells of mucous membrane of the stomach and the kidney and of the liver, were marked on microscopic examination. But there was no bacteremia, no inflammatory reaction in the form of wound cell infiltration such as one would expect in a reactionary inflammation induced by pyogenic microorganisms or their toxin. It was not a reaction to an infection, not a picture of a local active agent, but rather of a systemic condition of an induced cellular change."

By injecting homologous tissue extract into animals, I also induced ulcers. By inducing partial starvation in pregnant animals, erosions and ulcers also were found in the offspring.

I am glad that Palier has taken the position he does, based on his clinical work, but ultimate etiology can be best reached by animal experimentation. I wish also to correct his wrong interpretation of my many years of research. In scientific research, exact measurements and determinations can be made in every stage of the process. I have made these points on which my principle is based, fairly clear, in a recent presentation before the Academy of Medicine.

Fenton B. Turck.

Abstracts from Current Literature

DENTISTRY

Bacterial Origin of Dental Caries.—James McIntosh, W. Warwick James, and P. Lazarus-Barlow (*Lancet,* June 17, 1922), by a series of experiments, proved that the examination of selected carious material constantly contained a definite type of bacilli, which have the property of producing a high degree of acidity as a result of the fermentation of carbohydrates. It was shown experimentally that teeth left over prolonged periods in contact with cultures of the bacilli showed changes almost identical with natural caries, as was seen from the erosion of the enamel, the penetration of the dental tubules and the formation of foci of liquefaction. These bacilli resemble the acidophilus group of Moro in their resistance to and formation of acid, but biologically they differ in certain respects. The name Bacillus acidophilus odontolyticus, types I. and II., were proposed by the authors. The successful experimental production of artificial caries by pure cultures of these isolated organisms helps to establish the microbic theory of dental caries.

Oral Sepsis and Complications Due to Dental Disorders.—Artur Hauer (*Wiener klinische Wochenschrift,* April 20, 1922) cites the diseases traceable to dental disorders. Trigeminal neuralgia may be caused by pulp necrosis, thickening of the root, cement hypertrophy, pressure from foreign bodies and unerupted and dislocated teeth. There may be sensory, motor, secretory, or trophic disturbances, of which the sensory are the most common. Accommodation of the eyes has been markedly improved by the extraction of affected teeth; reflex asthenopia, miosis, mydriasis, ptosis, diplopia, nystagmus and strabismus have been improved or cured by extractions; neuralgia of the bulb, neuroparalytic keratitis, glaucoma, optic neuritis, photophobia, amblyopia and amaurosis have been traced to dental conditions. Disturbances of the tongue, palate, taste, ageustia, spasms of the chewing muscles, trismus, deafness and hyperacusis have disappeared after dental extractions. Reflex epilepsy has been caused by dental disorders. Hysterical toothache, oral hemorrhage and anesthesias, hysterical salivation and trismus, clonic spasms of the chewing muscles and pseudotraumatic hysterical ankylosis of the jaw have been noted. Trophic disturbances appear in tabes. Loss and loosening of gums, loss of teeth, pyorrhea, caries, dental tartar, fissured tongue, hypertrophy of the papillæ, ulcerations, chronic catarrhal stomatitis, odor of the breath from chloroform and rotten apples, delayed wound healing, and symmetrical neuralgias, point to diabetes. Hypochondria, mania, melancholia, hysteria and epilepsy have been cured by dental extractions and treatment. Dental nerves have degenerated after acute infections such as measles and scarlet fever. The upper intact incisors may become painful in coryza and after prolonged cold baths. Genital stimulation, uterine disorders, ovarian diseases and normal pregnancy have caused trigeminal neuralgia. The penetration of infectious material through the apical foramen produces granulomas. Hemorrhages from drugs or needle perforation may cause cysts in the presence of epithelial tissue, such cysts may fill the antrum. Lacrimal sac fistulas may be eliminated and tuberculous and actinomycotic dental fistulas heal after dental extraction; dental fistules at the angle of the eyelids, lid abscess and loss of an eye may follow. Fractured or unerupted teeth, sequestra, or foreign bodies may produce acute alveolar periostitis even in an edentulous mouth.

Oral Sepsis in Relation to General Diseases.—J. M. Ackland (*British Medical Journal,* June 3, 1922) asserts that, aside from the intestines, the alveolar process is the largest and most frequently diseased part of the body from which toxins are absorbed. Oral sepsis includes pyorrhea, alveolar abscess, and dead roots of teeth. The streptococcus causes the bleeding lesion, thus making way for the staphylococcus, which dissolves the tissue and creates the pocket. The commonest effect of oral sepsis is malaise, slackness, a tired feeling, lassitude and a general feeling of unfitness; also functional cardiac effects, as palpitation or nervous debility and depression. The cardiac conditions traceable to oral sepsis are ulcerative endocarditis, both acute and chronic, sometimes following the extraction of several septic teeth. Not too many septic teeth should be extracted at one sitting and the sockets should be well cleansed; strict oral asepsis is necessary. The use of hydrogen peroxide is recommended.

The commonest group of diseases following oral sepsis comprises neuritis, chronic rheumatism, arthritis and gout in those predisposed to it. The lesions may be plainly apparent or the streptococci, pus, and granulations may be seated near the apex of a tooth without local symptoms but with positive signs in the röntgenogram. In arthritic cases of dental origin, streptococci are found in the feces. Chronic inflammations of fibrous tissue and serous membranes are more often associated with dead teeth than with periodontitis; the streptococcus salivarius of acute suppuration is the one usually found in these cases. There may be no visible suppuration, but this does not necessarily mean that there is no infection present; the röntgenogram is of great assistance in these cases. The use of autogenous vaccines and the removal of affected teeth constitute the treatment. In active phthisis, the radical treatment of the oral sepsis should be delayed until a quiescent stage is reached and then carried out only very gradually. The same applies to chronic lymphadenitis.

Oral sepsis (pyorrhea) is the cause of nonhemolytic anemia in ninety per cent. of cases; sepsis of the antrum and nasal sinuses may be easily overlooked. Gastrointestinal disorders are often due to oral sepsis, associated with defective and painful teeth with consequent imperfect mastication. Traumatic lesions are sometimes aggravated and protracted as a result of oral sepsis. Oral asepsis reduces the frequency of chronic inflammations of the parotid and submaxillary glands and their ducts. Patients treated for Vincent's angina should not be discharged as cured until the fusiform bacillus is no longer found around the teeth. Oral sepsis may also produce chronic nasopharyngitis, septic bronchitis, skin disorders, or middle ear disease. Gastrointestinal disorders may develop in children. Night sweats are often present, tuberculosis is suspected, slight albuminuria may be found and nephritis may supervene. Tuberculous adenitis may be due to tooth infections. A child may not gain weight because of oral sepsis in the nursing mother.

Some Cutaneous Effects of Dental Sepsis.—Henry C. Semon (*Lancet,* May 6, 1922) points out that in some cases of chronic furunculosis the removal of a septic focus will lead to a cure, probably from, 1, the removal of an associated microorganism, such as the streptococcus, in a distant focus acting as an adjuvant to the staphylococcus infection, and 2, the reduction of the excessive blood sugar by an improvement in the patient's digestive power and a general metabolic activity following the removal of infected teeth. Furunculosis, urticaria, pruritus, and erythema multiforme may be associated with dental sepsis and disappear when these sources of infection are extirpated. The author found the streptococcus viridans and hemolyticus mainly responsible for his cases. All kinds of streptococci are normally found in the mouth. The reason why apical ends of devitalized teeth are apparently symptomless, but nevertheless are sources of metastatic infection, is that the bacteria are not usually encapsulated, but there is drainage into the circulation; swelling and tension therefore does not occur and hence there are no local symptoms. The portal of entry can be detected by the expert reading of röntgenograms and prints. It must not, however, be assumed that all cases of urticaria, erythema multiforme, intractable furunculosis and pruritus are due to dental infection.

Relation of Nutrition to Tooth Development and Tooth Preservation.—E. V. McCollum, Nina Simmonds, Ethel M. Kinney, and Clarence J. Grieves (*Bulletin of the Johns Hopkins Hospital,* June, 1922) describe a study of gross maxillary and dental defects in 220 rats which were typical of groups of experimental animals restricted to fifty-seven diets variously modified. From the results of this work the authors report that the internal structure of the skeleton of the rat can be changed at will by varying the animal's ration. Rickets, often of an exaggerated type, was produced by some of the faulty diets; others caused osteoporosis, and still others osteosclerosis. An analysis of the effects of the diets used on the skeleton indicates that the growth of the skeleton depends upon at least three factors: an organic substance present in certain fats which is not identical with the antizerophthalmic fat soluble A, calcium, and phosphorus. The percentage of oral defects was greatest in those rats fed the diets deficient in protein, calcium and fat soluble A. The rats on diets low in calcium showed the next highest incidence, and those on diets low in both calcium and fat soluble A had the third percentage of damage. The authors cannot at present name any one deficiency which specifically causes dental or oral disease, but they state it would appear that any slight variation in the American diet, which always so dangerously approaches the level of dietary deficiency, might become active at any period of lowered resistance or of physical or nervous stress.

GASTROENTEROLOGY.

Relation of Disease of the Gallbladder to the Secretory Function of the Stomach and Pancreas.—H. Ernest Griffiths (*Lancet,* February 10, 1923) shows that the gallbladder is only a unit in a definite digestive complex embracing the liver, gallbladder, pancreas and stomach, and that any disease affecting one unit is bound to be reflected in the whole system. Inflection of the gallbladder acting reflexly through the vagus nerve tends to cause hyperchlorhydria and regurgitation. If the sensory stimulus is greater, pylorospasm is the result of a sympathetic reflex through the ninth thoracic segment. Regurgitation from the duodenum may also be attributed to the unregulated flow of bile in cases where a gallbladder is no longer capable of acting as a reservoir. The pancreas is peculiarly prone to infection from the gallbladder. In the majority of cases infection occurs through the lymphatics, in others by the regurgitation of bile along the main duct consequent upon obstruction at the ampulla of Vater. This obstruction is frequently due to the spasm of Oddi's sphincter and occurs with pylorospasm. The secretion of the pancreas into the duodenum is seldom markedly diminished, the exception being in cases of catarrhal pancreatitis, but through lack of adequate admixture of bile the digestive function of the pancreatic juice may be seriously diminished. The internal secretion of the pancreas, except in rare cases, as in pancreatic necrosis, is not very much upset, although the increased amount of diastase in the urine and occasional positive Loewe's reaction are indications of some slight alteration. In some obscure cases of gallbladder disease, where the cause cannot be found by the ordinary clinical methods, exhaustive examination of the functions of the stomach and the pancreas may lead to a correct diagnosis.

Problems of Gastric and Duodenal Ulcer.—Berkeley Moynihan (*British Medical Journal,* February 10, 1923) considers a chronic ulcer (gastric or duodenal) as one with a visible and palpable lesion which has existed for months or years, with a crater of varying size, involving at least the muscular coat in depth and possibly extending through all the coats, in which case the base of the ulcer is formed by adhesions. Such ulcers are characterized chiefly by freedom between attacks of pain; the attacks are produced by the formation of new ulcers. Acute infections elsewhere may rouse activity in a dormant ulcer. An acute ulcer is one in which chaps, fissures, erosions, or extensive surface destructions of the mucosa, or even of deeper layers are found. Evidences of an impediment of the vascular supply may be found. Acute ulcers are multiple. The severe, protracted, and recurring attacks are produced by chronic ulcers. The following remarks are concerned only with chronic ulcer:

In a series of 718 cases reviewed, 531 were duodenal ulcer. Twenty-three cases showed gastric and duodenal ulcers combined. The mortality from gastrectomy in both types of ulcers was 1.6 per cent. The term juxtapyloric should be abandoned as it is unnecessary: the pyloric veins and pyloric white line clearly indicate the separation between the stomach and the duodenum. The chief clinical symptoms of ulcer of the stomach are pain, vomiting and hematemesis, the really important one being pain, which is characterized by its punctuality. The rhythm of the pain is noteworthy: that of gastric ulcer is "food, comfort, pain, comfort;" that of duodenal ulcer is "food, comfort, pain." The pain appears in an hour and a half in most cases of gastric ulcer and after two hours in most cases of duodenal ulcers. Seasonal variations are more common in duodenal ulcer. Hematemesis probably indicates gastric ulcer. In duodenal ulcer both hematemesis and melena may occur. Duodenal ulcer is far more common than gastric ulcer. The röntgenological evidence of gastric ulcer has the greatest value; the muscular tonicity of the stomach should also be investigated. Deformities of the duodenal bulb speak in favor of duodenal ulcer. The Rehfuss fractional gastric analysis is also valuable aid.

Medical treatment of the ulcer relieves the pain and curtails the attacks, but the period of repose is followed by a renewed and fiercer attack. However, healing of the ulcer may occur. In cases treated medically, the question of malignant degeneration must be given consideration. The author considers gastrectomy as thoroughly satisfactory in the great majority of cases; he prefers the anterior no loop method. He avoids gastrectomy only when the patient's condition is too poor to allow a major operation or when the location of the ulcer or any other of its attributes renders this operation impracticable or disproportionate to the patient's needs. He believes that by most watchful care, by direct transfusion of blood once or oftener and by the copious administration of glucose, with or without sodium carbonate, any required operation may be carried out safely.

Primary Union After Operation for Suppurative Appendicitis.—Robert G. Riddell (*British Medical Journal,* February 24, 1923) endeavors to obtain primary union, first, by protecting the wound as well as possible against infection, and secondly, if that fails, as it usually does to some extent, by trying to destroy the contaminating organisms. Where purulent fluid wells up immediately on opening the wound, there is little chance of keeping the wound clean, but in cases of localized abscess it is possible to protect the edges with tetra cloths stitched to the peritoneum, or with rubberbacked cloths held in place by special clips. If the abscess is small, the pus may be mopped out without soiling the wound, but even this may be difficult or impossible. It is advisable in all cases, therefore, to disinfect the wound after the peritoneum has been sutured. The appendix is removed with the usual technic, pus and fluid are mopped up as well as possible with dry gauze and the peritoneum and abdominal wall are firmly sutured. Various antiseptics were tried, but the author obtained the best results with flavine solution, 1:1000 in seven cases, all of which healed by primary union except one, where the tissues were soaked with purulent fluid as soon as the peritoneum was opened and where operation was long and the patient weak. The flavine should be very thoroughly swabbed into every corner of the wound, which should then be flooded with it and afterward gently dried out. Saline irrigations should be omitted, either for absorption or washing purposes.

Pyloric Stenosis of Infants.—Leonard G. Parsons and Seymour G. Barling (*Lancet,* January 13, 1923), in an analysis of ninety-four cases of this disease, of which thirty-six were treated medically, eight by gastroenterostomy after failure of medical measures and fifty by Rammstedt's operation, summarize their results as follows: 1. The results of medical treatment alone are very unsatisfactory. 2. Relief of the obstruction by Rammstedt's operation preceded and followed by a careful medical regime offers the best means of reducing the high mortality of this disease. 3. Rammstedt's operation allows the redundant mucous membrane to bulge and for a time abolishes the sphincteric activity of the pylorus. 4. Given early diagnosis and resort to treatment as above, they believe that the mortality can be reduced to twenty per cent. 5. Functional test meal examination of the stomach shows high rennin, high free acidity and high total acidity in the resting juice, delayed emptying and absence of duodenal regurgitation. 6. Chemical analysis of the stools negatives the suggestion that these patients are suffering from pancreatic insufficiency. 7. This and other evidence is opposed to the hyperadrenalism theory of the cause of hypertrophy as advanced by some authors.

Nondiarrheic Type of Celiac Disease: A Form of Chronic Fat Indigestion in Children.—Reginald Miller and Herbert Perkins (*Lancet,* January 13, 1923) describe a group of children who fail to thrive owing to their inability to absorb fat properly, and discuss the principles of their treatment. In spite of the absence of socalled diarrhea and of the typical pale, unformed and stinking celiac stool, this nevertheless is celiac disease in a mild form. These cases may be called nondiarrheic or dry form of celiac disease. A stool may contain a large excess of fat and yet be formed and colored if the contained fat occurs chiefly in the form of soaps; whereas, when chiefly in the form of fatty acids, the excess of fat causes the stool to be pale, unformed and offensive. The soapy stool is found in the nondiarrheic group and the fatty acid stool in the classical diarrheic form of celiac disease. Examples are quoted to show that the recognition of the nondiarrheic group suggests that the diarrheic cases may show to the naked eye considerable improvement in the stools without there being a return to the normal power of fat absorption. Its recognition also affords strong evidence against the view that celiac disease is due to an enteritis or that it has any essential connection with intestinal disease. A consideration of the two sorts of stool in celiac disease leads to the view that the pallor of the classical celiac stool is due to a masking of the pigment by the excess of fat present as fatty acid crystals.

Hypertrophic Pyloric Stenosis.—Leonard Findlay (*British Journal of Children's Diseases,* January-March, 1923) concludes that spasm of the hypertrophied pylorus is the most important factor in causing the symptoms. The results of treatment are invariably better in private than in hospital practice. Medical measures give as good, if not better, results than operation. Operation should probably be reserved for the youngest cases and for those seen soon after the onset of symptoms. The great danger to be avoided in any form of treatment is underfeeding.

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CLINICAL MEDICINE.

Blood Destruction During Exercise.—G. O. Broun (*Journal of Experimental Medicine*, January and February, 1923) noted a great decrease in total circulating hemoglobin and red cell volume in dogs maintained under sedentary conditions when they are exercised vigorously during several consecutive days. This would appear to be the consequence of increased blood destruction, unrepaired for the time being. He found a definite increase in the percentage of reticulocytes after exercise in animals previously kept to a sedentary life. This fact, coupled with his previous reports of changes in the hemoglobin percentage, plasma—cell ratio, and red count, offers additional evidence of the occurrence of an increase in blood destruction under the conditions of the experiment. Replacement by transfusion of blood destroyed during exercise prevented the reticulated cell reaction. Animals which had been rendered plethoric and then exercised showed no increase in reticulated cells, while plethora lasted.

In the fourth paper of the series (*Journal of Experimental Medicine*, March, 1923), Broun deals with the development of equilibrium between blood destruction and regeneration after a period of training. Animals which have been confined for but a short time do not show as large a decrease in cell volume following exercise as those which have been confined for several months. A dog which has been kept for a long time under sedentary conditions and then exercised continuously for several weeks will show a decrease in cell volume in the first or second week of exercise, but this is usually made up by the end of the third week. Apparently by this time the hematopoietic tissues have adapted themselves to the increased demands made upon them by the hastened rate of destruction. Autopsies on the experimental animals showed that the weight of the spleen is considerably greater in the exercised animals than in the controls, or than is usual with normal dogs.

Significance of Colloid Lability in the Blood.—J. von Darányi (*Wiener klinische Wochenschrift*, November 9, 1922) asserts that the determination of the colloid lability, as a rule, gives evidence of the extent of tissue destruction. It is of practical use in many respects. Inasmuch as the reaction in active tuberculosis and syphilis runs parallel with the extent and activity of the process, it may well serve as a quantitative measure in the more qualitative reactions of immunity. The reactions for syphilis, for example, may be three plus positive in entirely latent cases and negative in the most severe malignant forms; the tuberculin test is sometimes inversely proportional to the severity of the disease; the colloid lability, however, gives more accurate information as to the activity and extent of the disease. It gives more information as to the activity than the temperature, radiography and many other symptoms. This reaction may well be used as an objective therapeutic control according to the different conceptions (in syphilitic, tuberculous, and carcinomatous therapy). In pregnancy (indication for interruption in active tuberculosis) only the reaction proposed by the author is applicable, because the other tests are strongly positive in pregnancy alone. The use of this reaction in differential diagnosis, however, is limited, but it is useful in deciding the question of the existence of benign or malignant necrosing tumors, and also whether superficial catarrhal or deep processes, or whether organic or functional diseases are present. The determination of the colloid lability leads rather to a diagnosis of activity as to toxin formation and tissue destruction than to a specific diagnosis.

Studies in Focal Infection.—R. N. DeNiord and B. J. Bixby (*Journal of Laboratory and Clinical Medicine*, July, 1922) found in a series of several hundred cases that certain changes invariably took place in the blood chemistry of patients having a focal infection. The main fact emphasized in this paper is that infections, whether producing pus or not, give rise to a nuclear degeneration of a proteolytic type from the nuclei of the cells so broken down, the end product of which is uric acid. High uric acid in the blood, therefore, is indicative of nuclear degeneration, which in turn may mean focal infection. There are, of course, factors other than chronic infection which will cause a high uric acid, such as leucemia, primary anemia, cachexias, massive doses of x ray and radium, etc., but all of these conditions are susceptible to diagnosis and elimination .

The authors point out that the presence of a high blood uric acid should be followed by a thorough search for all possible primary foci of infection, and the elimination of all foci of infection will be followed by a return of the uric acid to normal. In the authors' experience practice based upon this assumption has led to satisfactory results. A table giving the results of their studies includes such diagnoses as erythema nodosum, sciatica, arthritis, gout, chorea, myalgia, and neurasthenia. In the series the uric acid varied from 3.2 to 4.5 mg. in 100 c. c. The treatment consisted variously of tooth extraction, tonsillectomy, appendectomy, or cholecystectomy. After appropriate treatment the uric acid ranged from 1.2 to 3.7.

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Rickets and Tetany*

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For many years rickets was looked upon as a disease of malnutrition in which there was a deficiency of mineral salts, particularly of phosphorus and calcium. Many theories have been advanced as to whether the deficiency of intake of these salts, the failure on the part of the infant to assimilate them, or their too rapid excretion from the body was the principal cause of the trouble. It is only comparatively recently that the theory of the disproportion between the amount of phosphorus and calcium in the system has been looked upon as playing a greater part than the deficiency in the amount of either or both present in each case. So much importance is now attached to this fact that two forms or kinds of rickets are recognized as occurring separately and distinctly from each other; one, in which the calcium is low and the phosphorus normal or above, being referred to as a low calcium rickets, and the other, in which the phosphorus is low and the calcium normal or above, as low phosphorus rickets.

Many authors, according to Tisdall, have been working on this matter, their views being based on the experimental production of rickets in rats, followed and supported by clinical observations in both private practice and institutional work. At a glance this may not seem to be a matter of great importance, and yet, if a physician should administer phosphorus to the limit in a case of low calcium rickets, in which the phosphorus was normal or above, you can readily see that, even though no harm was done by the excess of phosphorus in the system, there would be considerable danger of tetany developing, due to the prolonged period of calcium deficiency. On the other hand, suppose conditions were reversed, and calcium was being energetically administered in a case in which it was already normal, or above, while the infant's system was craving phosphorus, which might be fifty per cent. or more below normal in that patient at that time, one must admit that, to say the least, the rachitic condition would not be helped, even though the baby was not harmed.

I imagine I hear some of you say, "I always administer both calcium and phosphorus in all my cases of rickets," and I grant you that such is usually the case, and is perfectly proper, but I submit that to give the maximum of the one that is deficient and the minimum, if any, of the one that is normal or above, would surely produce better results in a shorter space of time, and tend to head off some of the complications and sequelæ that are frequently so disastrous to these patients, either in costing them their lives at the time, or in deforming or crippling them for life afterward. I also imagine I hear others commenting on the difficulty one would have in getting the calcium and phosphorus percentage estimated, which is quite true, a laboratory with an experienced person in charge being necessary for this purpose, but it seems to me that, nowadays, there are very few localities in which this could not be done, particularly where the information, when obtained, was going to be of so much value to the physician and so much benefit to the patient. On an average a little over ten mg. of calcium to the hundred c. c. of serum and a little over five mg. of phosphorus to the hundred c. c. of serum, has been found to be normal, and the diagnosis of rickets in all cases where either of these amounts has been considerably reduced has been supported and verified by the clinical symptoms present, whereas such has not been the case where there has been reduction in both of these substances; in other words, as mentioned above, it is rather the disproportion between the two, due to the reduction of only one, that seems to afford at least some explanation for the occurrence of the symptoms.

To illustrate what may be a bad result from delay in the proper treatment of the case, according to whether it is a low calcium rickets, or a low phosphorus rickets, I might mention the fact that it is in cases of low calcium rickets that tetany occurs, and, therefore, in such a case it is the calcium that one should be pushing the hardest, and giving but little, if any, phosphorus, as the amount of this ingredient present will be at least normal, if not above. To

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*Read before the York Medical Club, May, 1923.

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head off the development of tetany the child should be what might be called calciumized as quickly as possible, which usually would not be the case were one simply administering a calcium and phosphorus combination on the principle that he was dealing with a case of rickets, without having made any attempt to ascertain what form of the disease was present. It is true, of course, that tetany occurs entirely independent of rickets, but it is at all times a low calcium condition, whether it be present as a symptom of, or entirely independent of, rickets, and in any event, therefore, it is the use of calcium that is indicated, and not phosphorus.

With this explanation of my reason, perhaps my apology, for discussing this subject, I might at this time call attention to some facts in the etiology of rickets with which one may be familiar, but which at times may escape attention when endeavoring to locate the causative factor in the given case.

Hess divides the causative factors into four classes: 1, dietetic; 2, hygienic; 3, infectious, and 4, endocrinous, but admits that the latter two probably play a small part if any, the dietetic and hygienic factors offering the best solutions for the pathogenesis of rickets. He also calls attention to climate, environment, season, age, heredity and prematurity as predisposing or exciting factors, or both, all of which have no doubt been noted at various times in different cases by all. As to season, both the bottle and the breast fed baby are affected, the condition being worse in the winter and spring months. In the case of the breast fed baby, the mother does not get as much physical exercise in the fresh air and exposure to sunlight during these months, and, in addition, her diet of necessity is restricted, so far as fresh vegetables are concerned. When it comes to the bottle fed baby, it has been proved that the vitamines in the cow's milk are much reduced during the time the cow is stall fed as compared with the months when it is pasture fed. As to age, from the sixth to the sixteenth months the largest number of cases seem to occur, although others have reported its much earlier development, even being present at birth, but this is questioned.

While heredity is probably only a predisposing factor in exceptional cases, prematurity undoubtedly plays an important part in many cases, as, according to Hess, "the mineral content of prematures is below normal, as two thirds of the minerals are deposited during the last few months of fetal life, the fetus at six months containing thirty grams and at nine months one hundred grams. In the newborn, fully seventy-five per cent. of the ash content consists of calcium and phosphate, consequently rickets being a disturbance in the calcium and phosphate metabolism, the more premature the infant, the greater the deficiency in calcium and phosphorus, so that the surplus supply is exhausted earlier than in the full term."

Underfeeding is another factor in the development of rickets in the premature. The low calcium content of human milk and the difficulty of metabolizing even this food in sufficient quantities to prevent drawing on the inherited supply may be an active factor. When we come to take up the question of diet as a causative factor in a given case, we may have quite a problem on our hands. I feel, as do many others, that prolonged breast nursing, such as is so common among the negro and Italian races, is a fruitful source of trouble, and serves largely to explain the existence of rickets in breast fed babies. Then, too, if the recent work of Smith and Merritt is to be given its full value, we have all evidently been having the wrong idea for a long time in reference to the correct rules governing breast nursing and bottle feeding. After an exhaustive study of the subject, these authors present the following summary of their most interesting paper:

"From the preceding it is evident that nursing infants obtain the greater part of their feeding of breast milk in the first few minutes, from forty to sixty per cent. in the first two minutes, and from sixty to eighty-five per cent. in the first four minutes. This holds true whether the supply is abundant, moderate or scanty. After eight minutes few babies get any milk whatever. Only seventeen of our observations show any increase in weight after eight minutes; fourteen of these were from Tables I and II—good feedings; only three babies obtained milk after ten minutes. A few larger, vigorous infants, nursing from an abundant supply, may get small amounts of milk up to sixteen minutes.

"The babies who need both breasts usually get less from the second than from the first side, except when one regularly yields a better supply. The rate at which a baby gets milk from the second breast is similar to that of the first breast, i. e., from forty to sixty per cent. in the first two minutes and from sixty-five to eighty-five per cent. in the first four minutes. After that very little is obtained. The time after which a baby gets no more milk is usually shorter on the second breast than on the first.

"The poor feedings have been completed in a shorter time than the good ones. When the breast supply is evidently failing, the baby gets all he can in from three to five minutes, as a rule. It does no good to leave a baby a longer time (from fifteen to twenty minutes) at a failing breast in the hope of eking out a meagre supply.

"If a baby empties the breast in from five to eight minutes and shows no signs of discomfort from an adequate feeding obtained in that time, there seems to be no good reason why he should not take his bottle in about the same time. If the nipple holes are of good size so that the milk flows freely nearly all strong infants will finish the bottle in less than ten minutes. They evince less distress than the nurse does over the rapid feeding. On the other hand, a slow nipple either discourages the baby so that he will give up in disgust before he has finished the bottle, or else makes him swallow so much air that he vomits or has colic. We believe that from eight to ten minutes should be ample time for any but the feeblest infants to take a bottle.

"The method of fractional weighing may well be applied to every breast fed baby since it is the only way by which we can determine how long a given baby should nurse, and whether he needs one or both breasts.

"It seems fair to conclude that a normal baby who gets enough milk from one breast needs to nurse, as a rule, only from six to eight minutes, rarely from ten to twelve minutes.

"A baby who needs both breasts may nurse from six to eight minutes on the first and from five to seven on the second. Very few babies need as long as ten minutes on a breast. A good many will empty the breast in four or five minutes.

"There is no evident reason why a baby should not take a bottle feeding as fast as he does one from a breast."

In view of the foregoing, have we not probably been unconsciously and unintentionally insisting that the mother follow certain rules in the way she nurses her baby that were not only detrimental both to mother and child and to the milk supply itself, but also to the proper nutritional development of the child along the lines of providing it with antirachitic and antiscorbutic protection? This leads me to call attention to one important fact, namely, that when examinations of human milk are made to determine its quality, separate tests should be made of the milk from each breast, and preferably from the total twenty-four hour collection from each breast. The custom of pumping milk from each breast separately and then pouring the two together before the examination is made has many objections, as the difference between the two is oftentimes very great. I have in mind at present a woman from one of whose breasts the milk was nauseatingly sweet and the other equally nauseatingly salty. Then, too, the percentage of the various ingredients differs materially, and is evidenced by the frequency with which one or the other has been used, the mother often using one breast more frequently than the other because of the larger quantity of milk present therein and the greater satisfaction it gives the baby, when, as a matter of fact, if the one containing the smaller quantity were used the more often, the amount would probably be materially increased. Of course, as you are well aware, the only way to determine the quantity is to weigh the baby before and after nursing from each breast separately, at different times of the day over a period of a number of days.

When it comes to the bottle fed baby, we have an even greater problem on our hands. It has been estimated that cow's milk contains five times as much phosphorus as human milk, and four times as much calcium, and yet we have by far the greater percentage of cases of rickets in the bottle fed. What is the explanation? Many theories have been advanced, all no doubt of some value, but, personally, I believe the association of hygienic conditions in many cases, such as deficiency of sunlight and fresh air, neglect of such body functions as digestion and bowel action, deficiency of elimination, especially by the skin, due not so much to lack of bathing as to improper clothing, etc., need to be given more consideration in association with diet than has been our custom in the past, as we have been in the habit of looking upon these cases as being too exclusively due to diet.

Holt, in association with Courtney and Fales, in studying the question of calcium metabolism in relation to the great amount of this material present in cow's milk, stated that "in general he found that thirty-five to fifty-five per cent. of the calcium intake was absorbed. An excessive calcium intake did not increase the calcium absorption as the excess was excreted. If the intake of calcium oxide was very low, less than 0.10 gm. to the kilogram, the absorption of the calcium oxide was below the necessary requirements, and a negative calcium balance might develop. They found the best absorption of calcium obtained when the calcium intake bore a definite relation to fat intake," while McCollum believes that "in infants the reason that rickets develops is because the dilution of milk is such as to destroy or alter the proper mineral proportions when nothing else is added to the diet," and Voit asserts that "excretion of calcium is almost entirely through the intestines, especially the large bowel, only five to ten per cent. being excreted by the kidneys. Children suffering from chronic intestinal indigestion show a low calcium absorption."

When we take up the question of phosphorus metabolism, we find conditions in many respects are quite different, for example, Schabad states that "two thirds more of the phosphorus is normally excreted by the kidneys, the rest from the bowel, the proportion being eighty to twenty in the breast fed and sixty to forty in the artificially fed. During florid rickets the relations are sixty-five to thirty-five and forty to sixty respectively, and there is an absolute increased excretion of phosphorus. As the disease is arrested the proper proportions are reestablished and for a time there is a greater retention of phosphorus than normal," while Howland and Kramer have shown that "the blood phosphate is low in the blood plasma of rachitic children, and that the administration of codliver oil causes a marked rise." Hess and Gutman have demonstrated similar changes following exposure to the sun's rays and by use of quartz lamps. Hess claims that "phosphorus in the blood can be increased by feeding prosphorus by mouth."

I cannot but feel that McCollum's statement that "rickets develops because the dilution of milk is such as to destroy or alter the proper mineral proportion when nothing else is added to the diet," goes the farthest of any toward explaining the reason for so many cases in bottle fed babies, so far as the dietary cause for the trouble is concerned, but, as mentioned above, I do not think we should blame diet so much *per se,* but rather associate the probable causes more than we have done in the past. Hess, in summarizing his article on rickets, says, "It may be stated that rickets is a nutritional disturbance, especially affecting the osseous, muscular, and nervous systems, with resulting lesions due to improper utilization of calcium and phosphorus," which I believe explains the matter as fully and clearly as can be done from a diet standpoint.

It is quite unnecessary for me to describe the symptoms of rickets, although it may not be amiss to mention some of the early symptoms, as they are the ones most likely to be overlooked, particularly if one is not suspecting the case to be one of rickets. Among the earliest signs are fretfulness, irritability, restless sleep, excessive perspiration about the head, especially when eating and sleeping, pallor, constipation, frequently alternating with diarrhea, pot belly, umbilical hernia, and general backwardness in physical development, the infant not being able, as it should, to support its own head at four months, sit erect at seven months, stand at ten months, walk with help at twelve months and alone at fifteen months. There is usually a delay in the closure of the sutures and fontanelles, the anterior fontanelle not being closed by the eighteenth month, as it should, although the posterior may be closed, as it normally is, by the second month. Getting uncovered during the night is an important symptom, and I would remind you that the way in which this occurs needs to be noted; for example, if the child gets uncovered by crawling up on to the pillow, it is more likely to be a case of enlarged adenoids, the child suffering from air hunger, and seeking the highest place in order to breath easier, while if it gets uncovered by kicking off the bed clothes, it is quite suspicious of rickets. When it comes to the earliest changes in the skeleton, the socalled rachitic rosary, Harrison's groove, the squared head, flattened on top, and with marked frontal and parietal eminences, and the nodular enlargements in the long bones at the junction of the epiphyses and diaphyses are among the earliest and most noticeable signs, although the one that is considered pathognomonic of rickets is craniotabes. Dentition is frequently delayed, the teeth are often irregular and the first teeth are subject to early decay. A marked grade of secondary anemia is usually present, explaining the pallor frequently mentioned, and various nervous phenomena are invariably present.

Other changes in the skeleton that develop later are kyphosis, scoliosis and bowlegs. In reference to the kyphosis, which may sometimes be of tuberculous origin, I might mention that an important differential point between these two forms of the condition is that the kyphosis of rickets is reducible, by placing the child on the abdomen and overextending the thighs, which would not be true of tuberculous kyphosis. So far as the scoliosis is concerned, this usually occurs in the same direction, being largely due to the fact that most mothers carry their babies on their left arms, in order to have the right hand free, thus raising the left side of the pelvis, and allowing the right shoulder to droop, causing a bending, as it were, in the centre. Such being the case, much of this scoliosis could be avoided by educating mothers to carry their babies alternately on each arm.

When it comes to bowlegs, while too early walking, the body being too heavy for the legs to bear, and the diminution of mineral salts in the bones of the legs themselves, are both important factors, one that is frequently overlooked is the too long wearing of the diaper, the restriction in the action of the hip joints resulting therefrom, causing the child to assume an unnatural gait; in other words, mothers should be instructed to commence training their infants for the evacuation of the bladder and bowels at the third month, so that, by the time the child is ready to walk, its habits in these respects, at least so far as the bowels are concerned, will have been sufficiently developed along the line of cleanliness for diapers to be dispensed with.

In prognosis, rickets is essentially a chronic condition, although its duration may be materially influenced by the proper treatment, and particularly if that treatment be started early. However, in spite of this, some of the deformities may persist throughout life, as, for example, those of the pelvis, often observed by obstetricians. Rickets is never fatal *per se*, but it is a most important factor in reducing the child's resistance and impairing its vitality, thus increasing its susceptibility to various infections and diseases, especially those of the alimentary and respiratory systems.

As Hess states, "death may result from spasmophilic manifestations, more especially convulsions," and it is in this connection that I embody tetany in the title of my paper, because, as very well expressed by Shipley, Park, McCollum and Simmonds, "tetany is essentially an expression on the part of the nervous tissues of an insufficiency of the calcium and phosphate ions of the body fluids. Tetany is frequently associated with rickets because rickets is a disease in which the calcium ion in the body tissues and fluids is subject to variations. Tetany may occur independent of manifest rickets. Since tetany may occur with the low phosphorous form of rickets, it does not serve to mark off one form of rickets from the other. Tetany, however, is essentially associated with the low calcium form of rickets and, for all practical purposes, the low calcium form of rickets is the rickets of tetany. While occasionally cases are seen in which clinical evidence of rickets is not demonstrable, these cases are on the whole exceptional. On the contrary, many cases of rickets, even very severe types, exist in which tetany does not supervene."

As in rickets, diet, prematurity, age and season play a part in the etiology of tetany. So far as diet is concerned, however, while we see many cases of rickets in breast fed babies, we rarely see cases of tetany among the breast fed; in fact, breast feeding is one of the best methods of treating a case of tetany, and will produce the most prompt results in its cure, cow's milk and proprietary foods seeming to be the principal offenders. As stated under rickets, prematurity is a markedly predisposing factor, and for the same reasons as given under rickets, but breast feeding has a more beneficial effect in the prevention of tetany than it does in the prevention of rickets, largely, perhaps, because tetany, as mentioned above, is essentially associated with low calcium, while rickets may be due to either low calcium or low phosphorus. Concerning the effect of season, here again both the time of the year, and the etiological factors run parallel with rickets, which is equally true when it comes to age in its relation to tetany. Kramer and Howland found that "in children suffering from rickets alone, the phosphorus of the blood serum is low, and the calcium not far removed from the normal; in children suffering from manifest tetany complicating rickets, on the other hand, the calcium is low but the phosphorus not far removed from normal." Under these circumstances, one question is, what will reduce the calcium content, or the phosphorus content, in other words, affect only one or the other, and not both, and second, why is the calcium content of cow's milk so often reduced, causing tetany, while that of human milk is so rarely reduced that, as mentioned above, cases of tetany almost never occur in the breast fed. One theory advanced for this is the socalled parathyroid, MacCallum and his coworkers finding "that the parathyroid gland regulates calcium metabolism and that failure in its secretion results in a lessened retention." Granting that such is the case, why is not the parathyroid gland as often influenced in its regulation of calcium metabolism in infants fed on the breast, as in those fed on cow's milk? Can it be that it is this regulating influence of the mother's parathyroid gland, acting on her milk, rather than in the infant's parathyroid gland, acting on its digestive functions? Grove and Vines, in the *British Medical Journal,* report several cases, which, while covering a variety of conditions, were all due to some chronic toxic state, and all had a deficiency in the ionic calcium of the serum, due, perhaps, to a combination of calcium and toxin.

In the majority of cases it was possible to find a primary septic focus, and sometimes the administration of parathyroid caused a hidden focus to become apparent by increasing the leucocytic reaction to the attacking organism. An examination of the literature tends to establish the proposition that the parathyroid glands have a double function; first, a regulation of calcium metabolism, and, secondly, the power to render a certain toxic substance harmless.

Further, it may be noted that in animals whose parathyroid functions have been interfered with, either by removal or ligation of the glands, if tetany does not supervene shortly and so cause death, there is a strong tendency for the animals to die from an infective process.

It is possible that the continued absorption of toxic substances from some primary septic focus may eventually lead to partial parathyroid insufficiency and a disturbance of calcium metabolism. These two conditions will cause a decrease in the resistance of the tissues, so that they are rendered more liable to a secondary process. The locality of the latter lesion will depend on local conditions of nutrition, blood supply and so forth. As Brown, Courtney and MacLachlan state, it is evident "that there is some other factor than food which is responsible" for the disturbance of the phosphorus calcium ratio. One fact to be borne in mind is that while some of the work that has been done along these lines has been on whole blood, some has been done on blood serum, and Tisdall feels that perhaps the difference in the results of his investigations and those of Hess may be due to this.

To quote Hess again: "There is, however, grave question as to the relationship of parathyroid dysfunction and tetany in the infant. Pathological studies lead us to believe that parathyroid lesions in infantile tetany are the great exception. Parathyroid lesions have been described in patients who have shown no evidences during life of the pathognomonic findings of tetany. In summarizing the pathogenesis we may state that a diminution of the calcium salts in all probability is the most important factor in the development of this condition. However, the possibility of an absolute or relative excess of the phosphates, especially the sodium and potassium salts, playing an important rôle cannot be overlooked. Abnormal ratios in the body salts as in rickets play an important rôle. The relationship of disturbances in parathyroid functions to the diminution of calcium tissue content must be made the subject of further study before its importance can be fixed. Infections are the most frequent factor in precipitating manifest symptoms in the latent cases. The seasonal incidence emphasizes the importance of the relationship between active rickets, infections and spasmophilia."

Concerning the symptoms of tetany, they should be arranged in two classes, latent and active, the latent consisting of Erb's sign, being an increased electric hyperexcitability; Chvostek's facial sign, being a hyperexcitability of the facial nerve, and Trousseau's sign, which is elicited by moderately compressing the nerves and vessels of the arm, midway between the elbow and shoulder, producing the socalled obstetrical hand. Of these three signs the Chvostek is perhaps the most significant of tetany, at least in early infancy. When it comes to the active signs carpopedal spasms, convulsions and laryngismus stridulus are among the most common, and unfortunately, as tetany so frequently occurs at about the same age as dentition, this is frequently blamed for the convulsions.

As to the prognosis of tetany, this should always be guarded, although, on the whole, it may be said to be guardedly favorable, but so many things play a part in influencing the prognosis, such as the frequency and severity of convulsions, the presence of an enlarged thymus, such complicating diseases as pertussis, and the presence or absence of an associated rickets, etc., that the prognosis in each case of tetany is a law unto itself. As in rickets, while in most cases, if the child recovers, there are no bad aftereffects, yet, in some cases of tetany the children show for years after their recovery various nervous manifestations, and Hess even states that some "show mental retardation."

In considering the treatment of the two conditions, i. e., rickets and tetany, their close relationship to each other, from the viewpoint of etiology, naturally makes the treatments similar. For example, in both cases diet is the first and most important factor, and human milk by far the most valuable article of food for these little patients, provided, of course, that they are under the age of one year, for, as mentioned above, after this age human milk is one of the most common causes of rickets. Of course, the diet of the mothers in these cases is as important as that of the infants and needs to be as carefully investigated. Plenty of milk, eggs, butter, and green vegetables are essential, meat not being nearly as productive of calcium, phosphorus and vitamines as it is frequently given credit for. So important is the use of human milk for these little patients that, when the mother's milk is not available, wet nurses should be obtained when possible. In the absence of human milk, in cases of rickets, cow's milk will be the next best form of food, but, in cases of tetany, this is not by any means true, as we have shown above that it is in infants fed on cow's milk in which we get the greatest number of cases of this disease. For this reason, in cases of tetany, goat's milk, well cooked gruels, fruit juices, soups made from vegetables, cereals and meat, are preferable to cow's milk, and, if the case be one of tetany only, i. e., one without rickets, this diet would be an excellent prophylactic against the development of rickets.

It is not unusual in cases of rickets and tetany, whether occurring alone or in association, for symptoms of scorbutus to be present, and here again the diet mentioned would be indicated, both as a prophylactic, if scorbutus is not already present, and for its active treatment, if it is present. While on the subject of fruit juices, I might call your attention to the investigation of Gerstenberger, of Cleveland, in which he showed that orange juice had a marked effect in increasing urination, and, by depleting the system of considerable fluid in this way, tending rather to diminish than to increase bowel action, as we were taught in the past to believe. Gerstenberger also, as well as other investigators, has shown the great value of strained canned tomato juice as an antiscorbutic in these cases.

To refer again to cow's milk, the question of raw milk versus pasteurized milk should be considered. Undoubtedly, were raw milk as safe as pasteurized milk, it would be the one to use, as, while pasteurization does not alter the fat, carbohydrate or protein percentage, nor, perhaps, diminish the nutritive value of the milk, it surely does change the chemistry and deprive the milk of some of its socalled pep; in other words, it has been proved conclusively, I believe, that the vitamine content has been diminished by pasteurization. Another point to bear in mind in reference to pasteurized milk is that it does not keep very well nor very long after pasteurization, even where all precautions are taken, such as placing it in an icebox, etc., and, naturally, still less well would it keep in the homes of those in which we find most of our cases of rickets and tetany, in view of the unhygienic and unsanitary surroundings and the lack of appreciation on the part of the parents of the necessity for extreme cleanliness. I remember some years ago a physician from London addressed the Philadelphia County Medical Society on this subject, and showed that the numbers and kinds of bacteria present in pasteurized milk a day or two after the pasteurization process had been completed, even though the milk in the meantime had been kept in the most cleanly and sanitary way, were far in excess of what had been present previous to the pasteurization, the only question being as to the relative virulency of those before and after pasteurization.

When it comes to fruit juices, my custom is to start their use at the third month in bottle fed babies, and at the fifth month in breast fed babies, giving equal parts of fruit juice and hot water, usually an ounce of each, sweetened to taste, between feedings. Except for stewed prune juice, stewed rhubarb juice, and strained canned tomato juice, I use exclusively raw fruits, obtaining the juice from them by passing them through the ordinary little meat compress. Meat juices are also beneficial, particularly in view of the secondary anemia so commonly present, but one must bear in mind the necessity of moderately cooking the meat because of the danger of tapeworm if the meat be too raw.

Next to diet in the treatment of these cases come the effects of the sun's rays, and these infants should spend several hours a day outdoors in the sunshine, weather permitting. In the absence of opportunities for exposure to the sunlight, as, for example, in bad weather, the ultraviolet rays may be used with beneficial effect. The mercury vapor quartz lamp is frequently employed, and is as beneficial in the colored race as the white, as has been proved by several investigators. So far as the treatment of rickets and tetany goes, codliver oil heads the list of remedies, both for its prophylactic and its curative value. If phosphorus is added to the oil in doses of one two hundredth of a grain of phosphorus to one dram of codliver oil, the benefits are even more marked, in cases of low phosphorus rickets, while in cases of low calcium rickets, or tetany, either separately or in association, some form of calcium should be added to the codliver oil, and I am very fond of using the syrup of the lactophosphate of calcium in dram doses for this purpose. I realize the objection to the taste of codliver oil, but this may be overcome to a great extent by either administering it in fruit juice, or giving the oil ice cold from a warm spoon, the under surface of which has been covered with some pleasant tasting ingredient. I might mention in passing that the oil should always be kept in a stone jar or crock in the icebox, and not allowed to remain in the bottle in which it is purchased. Inunctions of two parts codliver oil and one part soap liniment following the daily bath are also of benefit, the soap liniment overcoming much of the unpleasant odor of the oil, facilitating its absorption, and preventing the skin from becoming dry and scaly.

SUMMARY.

1. There are two kinds of rickets, 1, low calcium, and 2, low phosphorus, in which one or the other of these substances is below normal, the other being normal or above.

2. The importance of prematurity as a causative factor in cases of rickets must be borne in mind, and given more weight than has perhaps been the rule in the past.

3. Tetany is due to low calcium, and may occur either separately or as a complication of low calcium rickets.

4. Rickets occurs in both the breast and bottle fed, and other factors beside diet must be taken into consideration when seeking the etiological factor.

5. The parathyroids must not be overlooked as a causative factor in tetany.

6. Every mother should be urged to nurse her baby for nine months at least, with the addition of fruit juice from the fifth month on, and the only diet to be considered when this is impossible is cow's milk, in cases of rickets.

7. When using cow's milk certified milk should be given the preference, when obtainable, otherwise pasteurized milk should be used reasonably promptly after pasteurization and kept on ice in the meantime.

8. The testing of whole blood or blood serum for its calcium content may readily be performed in any laboratory, and the performance of this test is of sufficient value to warrant its being done in all cases of suspected rickets or tetany, or both, in order that one may know whether it is a question of administering phosphorus or calcium to the limit. By this means many cases of tetany will be prevented, both as a complication of rickets and as a disease *per se*.

9. The correct treatment of these cases means so much, not merely so far as life is concerned, but more particularly the prevention of deformities, that a day or two's delay while awaiting the results of the calcium test is time well spent.

10. Codliver oil, with phosphorus or calcium, or both, is the only treatment to be considered, outside of diet and hygiene, and the most important point in the use of these remedies is to be sure to give enough of the one that the child's system craves, the diminution or absence of which has probably been the etiological factor in causing the symptoms.

The author's references will appear in his reprints.

The Instability of Adolescence and Its Treatment from the Endocrinological Viewpoint

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From the viewpoint of physical and mental health there is no more important period in the person's existence than that of puberty, involving as it does most radical changes in all physiological functions. As stated by Hall (1) "Adolescence is a new birth, . . . The annual rate of growth in height, weight, and strength is increased and often doubled, and even more. Important functions, previously non-existent, arise. Growth of parts and organs loses its former proportions, some permanently and some for a season. Some of these are still growing in old age and others are soon arrested and atrophy. The old measures of dimensions become obsolete, and old harmonies are broken. The range of individual differences and average errors in all physical measurements and all psychic tests increases. Some linger long in the childish stage and advance late or slowly, while others push on with a sudden outburst of impulsion to early maturity."

Physical and mental breakdown in youths of both sexes from twelve to eighteen years of age are common and health impaired in some degree is so frequent as to require no emphasis. Every year more than twenty thousand adolescents are afflicted with dementia precox and a considerable proportion of suicides in this country are in children of school age. Goitre, and other forms of endocrine disturbance, chlorosis, and other anemias, epilepsy, tuberculosis, gastric and duodenal ulcer, nephritis, various neuroses, and a host of minor maladies are likely to make their initial appearance at this time or to become exaggerated to an alarming degree. Normally the healthy human being passes through the physiological changes incident to pubescence without mishap and with only those milder manifestations of imbalance inevitable to such comparatively sudden changes in the economy. However, we must face the fact that a large proportion of the population are not normally healthy, and that constitutional inferiority is rather the rule than the exception. Further, the stress and strain of modern life tends to increase deficiencies which might otherwise be negligible.

It is not my intention to discuss in this paper gross abnormalities of mental and physical deviation but merely to call attention to some of the milder manifestations of imbalance occurring at the adolescent period, which are met with frequently by every physician, and which deserve more than the indifference usually accorded them. The instability of adolescence which is sufficiently grave to warrant our attention usually has its beginnings early in the life of the individual through causes which may be hereditary, acquired or a combination of both. Thus as etiological factors there may have existed: 1, defects in the chromosomes of the ovum or spermatozoon of parents; 2, toxemia in the parent, or parents, affecting the ovum or spermatozoon, or both, resulting in a defective impregnated ovum or germ; toxemia in the mother, or poisoning of the germ because of local disease in the endometrium, or insufficient nutrition of the developing ovum, or unfavorable environment in postnatal life leading to disease, to malnutrition or to toxemia; 3, a combination of hereditary and environmental causes, which is perhaps the most frequent. (Noble).

Thus vitiating influences interfering with normal cell development and with the natural force of growth become aggravated because of the intimate interrelation and interdependence of the various systems of body cells, among the most important of which are those initiators and regulators of correlative growth—the vegetative nervous system and the ductless glandular systems, and through the formation of a vicious circle further impairment of somatic and functional integrity results.

Most significant phenomena at this period are those relating to the endocrine glands. Coincident with the involution of the thymus occurs increased functioning of the thyroid, the pituitary, the chromaffin system and the gonads. Under normal conditions these act in harmonious equilibrium and through the correlative activation of all bodily processes the child metamorphoses into youth gradually and uneventfully. But, as a chain is as strong as its weakest link, so is the adolescent as strong as his weakest organic entity, whether it be nervous, endocrine or other. The strain of puberty is then all that is necessary to bring out inherent inadequacies.

As an access of function on the part of the endocrine system is the exciting cause of the phenomena of adolescence it is natural that many of the abnormalities incident to this period should be attributable to irregularities of function in these important organs. Not only may somatic and physiological anomalies have their origin in the endocrine organs but also behavioristic anomalies as well. For as Cushing has stated (2) ". . . it is quite probable that the psychopathology of everyday life hinges largely upon the effect of ductless gland discharges upon the nervous system. This is particularly worthy of consideration in the study of child psychology in its relation to puberty and adolescence, especially in those individuals in whom there is some underlying, possibly inherited, functional deviation in the chemistry of the internal secretions."

For a number of years, since Charles P. Noble, whom most of us know as a brilliant gynecologist of a few years past but possibly few know as a deep student of genetics, of biology and the phenomena of degeneration, first impressed it upon my mind, I have emphasized the importance of an underlying constitutional hypoplasia in the etiology of developmental defects in children. In a more or less general hypoplastic constitution there is likely to be considerable involvement of the glandular structures, the symptoms of which are likely to become most manifest at puberty. All endocrine irregularities manifesting themselves at puberty do not, however, have a basis of constitutional inferiority, for as Hoxie (3) says, "All endocrine anomalies are not congenital but many of them are the results of accidents occurring in adolescence and early adult life."

A syndrome which even in its frequently met milder forms is responsible for much instability at this time is one of which the manifestations are soft velvety skin, retarded appearance of axillary and pubic hair, delayed development and differentiation of genital system, disproportionate skeletal growth. These patients are fatigued easily, are subject to dyspnea on exertion, are likely to faint and collapse in critical situations, and are liable to syncope and even death under narcosis, from fright, and as the result of profound exhaustion. They are subject to urticaria, asthma, hay fever, acidosis and enuresis, are unduly vulnerable to infectious diseases, especially to tuberculosis, and are frequent sufferers from nephritis and diabetes. An existing tendency toward stammering or stuttering becomes aggravated at this time, and epilepsy frequently makes its appearance during this epoch in these subjects.

Bartel (4) observes that suicide is a not infrequent termination to their lives. The behavioristic irregularities are founded upon the easy fatigability, the headaches and other organic pain sensations and from the sense of inferiority developed as a result of appreciation of their own physical and functional anomalies. The mental capacity is often decidedly subnormal though this is by no means a constant concomitant, as a high degree of intellectuality is often found especially in the milder grades.

Such patients are likely, however, to be unstable, eccentric, and incapable of sustained application, and so become lax in their school work, do not take part in the activities of their comrades, and become careless and untidy about their persons. Feeble emotional inhibition is common and moral inferiority may be shown by pathological lying, stealing, and other traits. My experience with these persons in juvenile courts has shown me that many youthful delinquents are of this type and that usually they come into conflict with the law more through the influence of a stronger personality than through their own initiative. Sometimes, however, aggressive persons are met with in whom the sense of inferiority seems to drive on to extremes of action in an endeavor at compensation. Among sexual offenders the individual of this type is usually the passive instrument, in the case of the female easily seduced not by reason of strong libido but because of weak resistance and lack of ethical appreciation. Both sexes are prone to become the victims of sexual degenerates, especially because of their bodily configuration being especially attractive to inverts.

While indications of anomaly of the thymus are frequently apparent in these cases, the anomalies of development have been ascribed to deficiency of the gonads, underactivity of the adrenals, and of the pituitary. Timme (5) contends that the syndrome is pluriglandular, dependent in a large degree upon deficiency of the chromaffin system. In this I agree and am also inclined to believe that the enlarged and persistent thymus may be a factor only through reactivation (Hoxie) of the thymic parenchyma. This reactivation may be secondary to disturbance in endocrine equilibrium rather than causative.

With the approach of puberty the thyroid becomes more active, both as a cause and as a result of the increased metabolic demands of the economy. Upon this increased activity depends, in large degree, the sexual differentiation and maturity of the individual. To an extent hypertrophy at this time is physiological and normal, giving to the young girl the full round throat, esthetically desirable, and to the boy an added prominence to the region of the enlarging larynx. Both sexes at this time are thyroid conscious, of constricting bands about the neck. Hence the low neck attire of the flapper and the sport shirt of the hobbledehoy. In the organically inferior the thyroid is either inherently inadequate to the increased demands upon it, or if normal must compensate for the insufficiency of other structures; in either case it may become overactive. Irritating factors of various kinds, toxic, emotional and reflex, may also cause thyroid hyperactivity.

The manifestations are those of an overdrive-excitability, overactivity with intervals of fatigue, emotivity, in fact all the manifestations of hyperthyroidism found in the adult but modified in certain aspects because of the lesser adjustability of the subject. These causes are often difficult problems in home and school and require careful and judicious handling. They form a fairly large proportion of juvenile delinquents, are aggressive, impatient of restraint, are gang leaders, and disturbing elements generally. They are often hypersexual and thus prone to sex delinquencies of an aggressive type. Thus in discussing the premature eroticism leading to sexual misdemeanors I have elsewhere stated (6) that in making examinations in juvenile courts I have been struck by the fact that practically without exception all girls charged with sexual offenses have enlarged and overactive thyroids. Just within the last few days I have seen a colored girl, aged twelve, brought into a juvenile court because of nymphomania and seduction of other children of both sexes to unnatural sexual practices who has a marked hyperthyroidism, enlarged thyroid, pulse 150, tremors, slight exophthalmos.

In more severe degree of organic insufficiency of the thyroid or when the gland has been crippled by an acute toxemia earlier in childhood, or by a milder long continued toxemia, it fails to meet the increased functional demands and hypothyroidism results. These subjects become more or less dull and lethargic, are unable to keep up with their classes, fatigue easily, are moody, introspective, and may put on weight. In girls the menses are delayed, irregular and painful. These subjects are fretful and querulous and incapable of sustained effort.

True dystrophia adiposogenitalis is usually due to tumor or injury to the pituitary and is characterized by genital aphasia, adiposis and deficient skeletal development. However, minor forms are frequently met in which the pituitary deficiency is transitory or which respond to treatment with subsequent normal development. These subjects in contradistinction to the case with organic impairment are often alert mentally, goodnatured and physically active but may be defective in ethical appreciation. One of my patients obtained large sums of money on several occasions by forgery, but after custodial care in an industrial institution under favorable hygienic conditions with pituitary feeding the hypopituitary manifestations disappeared and in several years there has been no delinquency.

Tucker (7) in a most comprehensive paper in 1918 called attention to the psychic manifestations of pituitary anomaly in adolescents. Eunuchoid types in mild degree are met with in adolescents of both sexes. These exhibit no special behavoristic characteristics other than asthenia and immaturity of judgment.

Since the phenomena of adolescence are intimately concerned with the sexual maturation of the person it is but natural that manifestations referable to the reproductive organs and functions should occur at this time. Mention of such anomalies has already been made in connection with disturbances in other endocrine organs and in fact so intimate is the relationship existing between the gonads and the rest of the endocrine system, the thyroid, pituitary and suprarenals being responsible for development and subsequent activity, and the thymus, and possibly the pineal, for restraint of precocity, that discussion of the former structures can hardly be separated from the former—at least in a paper of the present scope.

Functional hypoadrenia ("a symptom complex of deficient activity of the adrenals due to inadequate development, exhaustion by fatigue, . . . or any other factor, . . . capable of reducing their secretory activity." Sajous) is frequently found in adolescents, and is marked by sensitiveness to cold and cold extremities, hypotension, weak heart action, anorexia, anemia, constipation, asthma and other manifestations of hypersensitiveness, and by psychasthenia. These patients are unable adequately to meet the demands of ordinary life. Fatigability is a manifestation of the condition and exertion or sustained effort increases the adrenal depletion. They are emotional, crave excitement, but are fatigued by excitement. Often clever students, their work is sporadic and superficial. Their enthusiasms are intense but shortlived, but may be revived after sufficient periods of rest. They are unduly susceptible to infections and toxemias, and to reflex irritations.

The treatment of the manifestations of instability in adolescence may be divided as follows: 1, Preventive; 2, hygienic; 3, medical.

PREVENTIVE.

Could we begin our treatment with the grandparents our results might be more brilliant, for in many instances we are dealing with the end results of a long line of perverted physiology, aggravated by extraneous, often preventable, pernicious influences. However, as our patients of the present generation are the grandparents of the future the situation is not without hope. Prenatal hygiene and treatment of the expectant mother, in selected cases by endocrine therapy, offers encouraging results. Proper attention to nutritional needs during infancy and childhood (McCarrison (8) has observed, in the course of feeding experiments in animals, that malnutrition from insufficient or improper diet, gives rise to enlargement of the adrenals and sometimes of the pituitary body with atrophy of all other endocrine structures) fresh air, exercise, clothing, sleep, etc., avoidance of undue fatigue and strain, shielding from infection and all measures which may be included under the term health culture have their influence for good in preventing and combating endocrine instability.

The medical treatment of chronic states of ill health, of anemia (of the greatest importance in my opinion), malnutrition, etc., is most necessary. Marine and Kimball (9) have shown what can be done in childhood in the way of prevention of simple goitre by the administration of three to five mg. of iodine twice weekly over a period of one month and repeated twice yearly. Of 2,190 school girls taking two gm. sodium iodide twice yearly in only five thyroid enlargement developed, while of 2,305 not taking the treatment in 495 enlargement developed. Of 1,182 with goitre taking the treatment 733 thyroids decreased in size; of 1,048 with goitre not taking the treatment 145 decreased in size.

During acute disease and during convalescence due consideration should be accorded the possible deleterious effects of the disease processes upon the endocrine system, and the proper steps taken to combat these effects. Care should be used that the therapeutic measures utilized in the treatment of the disease shall not harmfully affect the endocrines. I am convinced that overzealous use of serums, vaccines, and other foreign proteins, and the intravenous injection of chemical substances is sometimes followed by permanent damage to the endocrine system and to the nervous system, as a result of anaphylaxis and allergy.

The hygienic supervision of the unstable adolescent is of the utmost importance, probably of more importance than more strictly medicinal treatment. Modern life with its fetish of strenuosity exposes the youth to the very influences which are most inimical to his proper development. Arduous school work with long hours, lessons to be prepared at home, competitive sports without proper supervision, movies, jazz, erotic literature, joy rides, inadequate meals, and other factors all tend to increase existing instability and to establish instability in the organically stable. Modern usage takes no account of the phenomena of normal adolescence, of the lassitude of mind and body alternating with periods of undue activity, the emotional unrest, easy fatigability, the egoism, the need for much sleep, much food, and much fresh air and sunshine. The adolescent should be carefully studied in regard to his existing capabilities and his duties and activities modified as required. Except where actual hyperthyrodism exists, in which case complete rest is needed, the youth will be benefitted by active outdoor exercise, his school work should be curtailed if necessary, his hours of sleep should be long, his meals bountiful with due regard to the craving for sweets, his skin kept active, and he should be encouraged to find relaxation in activities which interest without undue emotional excitement.

The psychic life of the adolescent is full of conflicts, complexes, and suppressions. Proper physical hygiene and sympathetic understanding on the part of parent, teacher or physician are the best methods to bring about adjustment.

Though normally "youth is a disease which cures itself" the class of cases which we have been considering require something more than neglect or even ordinary hygienic care. Anders (10) impresses the fact that "we must not be unmindful of minor degrees or earlier stages of dysfunction, where it is difficult in the extreme to recognize any of the features which ordinarily make up the characteristic syndrome. These, however, call for and are readily amenable to appropriate specific organotherapy." The first step in treatment is the removal of all possible sources of focal infection and reflex irritation. The anemia, present in the majority of cases, must be adequately treated. In girls the anemia is often chlorotic in type. The above is often sufficient to bring about a satisfactory state of endocrine, nervous and emotional equilibrium with the gradual amelioration of untoward symptoms. It often requires a nice discrimination to determine whether symptoms of imbalance are manifestations of normal or of perverted physiology. The routine administration of organic products is reprehensible and likely to convert normal physiological processes into abnormal ones. These substances are, however, of very great value when indications for their use actually exist.

In deficiency of the chromaffin system suprarenal and pituitary substance are of value. I prefer the whole pituitary gland given in small doses and increased gradually. The action, when the basal metabolism rate is low, is enhanced by the addition of thyroid one one hundredth to one tenth grain. In girls I also give ovarian substance. Where thyroid inadequacy exists, with or without hypertrophy, thyroid substance or extract, or thyroxin is given with advantage. With a drug as potent as thyroid the same care should be taken in administration as with arsenic, belladonna and other toxic drugs. Pollock (11), collaborating with me in a paper to be published, has called attention to the dangers of unchecked thyroid therapy and also to the advantage of therapeutic control through periodical basal metabolism estimations.

CONCLUSIONS.

1. The period of adolescence is, in both sexes, a time of unusual physical and mental stress, tending to increase inherent weaknesses and to initiate organic and functional anomalies.
2. The endocrine system, because of its intimate concern with growth and development with metabolism and with the phenomena of sexual maturity, is particularly prone to disturbance of function.
3. The endocrine implications may manifest themselves in many and diverse ways, requiring careful analysis for detection and for correct evaluation of their relative importance.
4. Well advised prophylactic and hygienic management and, in properly selected cases, rational therapeutic intervention will accomplish much in the way of prevention and correction of anomalies of physical and mental function during this important epoch.

The author's references will appear in his reprints.

Foreign Proteins in Prophylaxis and Therapeutics

By FRANCIS E. STEWART, M.D., Phar. D., F. A. C. P.
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To obtain a proper perspective of our subject it is necessary to refer to the socalled allergic state and to immunity conferred by an attack of infectious disease or obtained by vaccination.

THE ALLERGIC STATE AND IMMUNITY.

The word allergy means altered reaction. A change is produced in the body of the vaccinated individual by smallpox vaccination. The power of quick response has been conferred upon the body cells When an individual has been successfully vaccinated for the first time the well known vesicle, surrounded with an inflammatory areola, appears after a distinct period of incubation. The vaccinated person is now immune to smallpox for a period of several years during which time the immunity gradually loses its potency. If, during this period, the immunized person is revaccinated there appears to be no reaction; but careful observation will show that this is not the case. There is a response, but the reactive phenomena are so mild, and the changes occur so rapidly, that they usually pass unnoticed.

This peculiar change in reaction was noted by Jenner but soon forgotten. Later Brice observed the same phenomena, but it was not until the researches of Von Pirquet again brought the subject into prominence that it attracted serious attention. According to the present view of the allergic state as an explanation of immunity, the body cells are sensitized by the first vaccination and are thus in position to respond more promptly when again attacked by the same microbe and defend the body by producing the antimicrobic substances to which immunity is due.

WHAT IS A VACCINE?

The term vaccine is derived from the Latin *vaccinus* of or from cows (*vacca* a cow). It is applied correctly to the virus of vaccinia, or cowpox, used in vaccination. Of late years it has acquired a secondary meaning and is now also applied to any substance for preventive inoculation. Macfarland (*Cohen's System of Medicine*) suggested the name bacterin as more appropriate than vaccine for bacterial cultures used for inoculation. At the suggestion of Dr. S. Solis-Cohen, Philadelphia, I used it for the first time in current medical literature in a paper read before the American Therapeutic Society, in Washington, D. C., 1910.

The term vaccine as now used by immunologists applies to any bacterial product used for preventive or therapeutic inoculation. It is defined by some authors as a disease virus so modified as to destroy its power of infection, but not so altered as to destroy its immunizing properties. Smallpox vaccine is smallpox virus modified by passage through the bovine species. Typhoid vaccine is typhoid bacilli modified by heat or antiseptics.

Victor C. Vaughan speaks of infective agents (the known infective agents are bacteria, protozoa, moulds, and yeasts) as living proteins, and points out that their pathogenicity is due to their power of growing and multiplying in the living body. Immunity is due to the specific power of the body cells to defend the living body from the attacks of infective agents by the production of specific antimicrobic substances. As stated by Hektoen (1), "Immunity against infection may be regarded as merely a special instance of the power of the body, by special mechanisms, to rid itself of harmful foreign proteins."

THE DOCTRINE OF SPECIFICITY.

The immunity acquired by an attack of an infectious disease is *specific*. Recovery from smallpox does not confer immunity to typhoid fever; neither does recovery from typhoid fever confer immunity against smallpox. And the same principle of specificity applies to vaccination against these infectious disease, that is, smallpox and typhoid fever, with the appropriate vaccine.

In addition to their specific properties, vaccines, in common with all foreign substances, when introduced into the living body cause defensive reactions. These reactions are merely Nature's efforts to get rid of the harmful substances. But these defensive reactions are not specific. A wound in healing not only rids itself of the bullet that produced it, but also rids itself of the extraneous substances carried into the wound by the bullet.

NONSPECIFIC PROTEINS AND THEIR VALUE AS THERAPEUTIC AGENTS.

More recently certain nonspecific proteins have come into vogue as therapeutic agents. They are of no specific value. Only specific proteins are capable of immunizing against infectious diseases. Injections of milk, normal horse serum, or other nonspecific protein are of no specific value in treating typhoid fever, whooping cough or pneumonia. Yet competent observers find nonspecific proteins of therapeutic value. How is this to be accounted for? The answer is to be found in the fact that reactions produced by foreign substances when introduced into the living body not only rid the body of one foreign substance but also rid it of other foreign substances as well. This becomes the more apparent in the light of experiments made by several medical scientists who have injected various kinds of foreign substances intravenously and observed the same phenomena. For example, the intravenous injection of colloidal metals (colloidal solutions of metals), as well as various nonspecific proteins, has been effective in aborting infectious arthritis. The best results are obtained when sufficient doses are injected to cause reactive phenomena characterized by a chill, followed by high fever, and followed, in turn, by a sweating stage.

All of these foreign substances, when introduced into the body, stimulate the body cells to get rid of them, and, in so doing, aid the body to get rid of disease producing microbes if they are also present. But these nonspecific reactions confer no immunity to another attack of the same disease.

THE SUPERIOR VALUE OF SPECIFIC PROTEINS.

As stated by Hektoen, from whom I have already quoted: "The production or heightening of the natural immunity possessed by every person against the infectious diseases is one of our chief and most potent measures in their prevention and cure. It is now quite generally accepted that antitoxic and antimicrobic effects occurring during the process of immunization depends upon the presence within the body of substances of *limited specific affinities*—antitoxins, opsonins, immune bodies or amboceptors, that are produced by the body cells." I have used italics to emphasize the fact that the body cells are incapable of producing antibodies specific to infectious diseases unless *specific* bacterins are used, that is, bacterins containing the bacteria corresponding with those causing the disease.

The superior value of specific proteins, therefore, is apparent. They possess all the nonspecific value of nonspecific proteins, and the great advantages resulting from their specificity.

Bacterins, or vaccines, therefore, owe their therapeutic properties to their power of stimulating the body cells to defensive reaction—a property shared by foreign substances generally when introduced into the body—and also to the power of stimulating the body cells to produce specific antibodies, and so sensitizing them at the same time that they become allergic and thus prepared to respond promptly when again attacked by the same microbe.

Referring to the experiments upon which the evidence that nonspecific substances introduced into the body possess therapeutic value is based, an editorial writer (in the *British Medical Journal* if my memory is correct) says that the stimulating effect of their presence furbishes the defensive mechanism of the body and thus aids in throwing off the infecting microorganisms when used in the treatment of infections. Or, as expressed more happily by Gellhorn (2), "all cells of the body feel this rejuvenating influence, but none more so than those cells which have been weakened or paralyzed by infection. These cells seem to obtain a new lease of life; some of their normal vigor returns and their natural means of defense becomes reassembled." This is Gellhorn's verdict founded upon his use of milk in the treatment of pelvic infections. A similar verdict would doubtless have been given if a specific bacterin had been employed, and, in addition, a certain amount of insurance against subsequent attacks might possibly have been secured.

WRIGHT'S CHANGE OF VIEW REGARDING SPECIFICITY.

Sir Almroth E. Wright, the "father of bacterial vaccine therapy," no longer believes that bacterins, to be of therapeutic value, must be strictly specific. He no longer teaches that "microbic infections can be warded off only by working with homologous vaccines, and that we must in every case before employing a vaccine therapeutically, make sure that the patient is harboring the corresponding microbe." In his lecture on the Lessons of the Great World War (3), delivered before the Royal Society of Medicine, February 25, 1919, he said "it is of fundamental importance that we discard the confident dogmatic belief that immunization must be strictly specific." However, in saying this he made it manifest that he had no intent of discarding his belief in the doctrine of specificity. He teaches that bacterial vaccines, when used therapeutically, not only possess the power of specific immunizing response, but also possess what he calls collateral immunizing properties.

AUTOGENOUS VERSUS STOCK VACCINES.

Contrary to the belief of certain of his followers, Wright never taught the exclusive use of autogenous vaccines. On the contrary, he used stock bacterins as well as autogenous bacterins from the beginning of his career as an immunologist. It was in using and comparing the results obtained in the use of autogenous and stock vaccines that he was led to conclude that their efficiency was not exclusively due to specific immunizing response. He said, in his lecture (3), "Among, I suppose, many thousands of patients treated by vaccine therapy in private and in hospital, it happened every now and then that a patient was treated with a vaccine which did not correspond with his infection, and that patient indubitably benefitted. Again, it was not an uncommon experience for the subjects of a very chronic infection (such as pyorrhea) who were first treated with stock vaccine, and afterward with an autovaccine, to assert that they derived more benefit, and to ask to be put back upon treatment by the stock vaccine. We should proceed upon the principle that the best vaccine to employ will always be the vaccine which gives on trial the best immunizing response against the microbe we propose to combat."

MIXED VACCINES.

Referring to mixed vaccines, Wright said: "They should be recommended in cases where from the outset there is very little response from the homologous vaccine, and also where, as in very long standing cases of tubercle or streptococcus infection, the power of direct immunizing response is becoming exhausted." Dr. A. P. Hitchens, in a paper read before this society several years ago, called our attention to the fact that "Nature is an unscientific jade" and cures mixed infections with mixed bacterial treatment. In a mixed infection Nature does not single out the initial invader and confine her attention to its destruction, but has taught the body cells to repel the invasion by producing antimicrobial substances for destroying all of the germs taking part in the infection.

THE USE OF BACTERINS IN ACUTE INFECTIONS.

The old idea that bacterins are dangerous in acute infections still prevails with some physicians. Wright has been combatting it from the beginning of his advocacy of bacterins as therapeutic agents. In his lecture before the Royal Medical Society, just quoted (3), he found it again advisable to answer those who criticize the use of bacterins in the treatment of acute infections by putting forward the theoretical argument that "to inoculate microbes into the already infected system would be as illogical as to instil further poison into an already poisoned system." In answer to these objectors Wright calls attention to the fact that the body should not be visualized as a single and undivided unit. One region of the body may be making immunizing responses to an infection while the other is inactive. "For instance, in the stage of incubation it is presumable only the region which is actually harboring a microbe" is responding, "and in the stage of generalized infection it is presumable that the entire body is incited to respond. And, again, in localized infections we may—making some reserves—assume that we have only localized infection. Placing ourselves at this point of outlook, therapeutic immunization will, it is clear, be theoretically admissible so long as there remains in the body any part which is not already making its immunizing response. And the program of therapeutic inoculation would accordingly consist in exploiting, in the interest of the infected regions of the body, the immunizing response of the regions which are not infected."

Whether or not Wright's ingenious explanation in answer to his critics is accepted, the fact remains that some of the best reports regarding the efficacy of bacterins as therapeutic agents come from physicians who are using them in the treatment of acute infections. E. C. Laferty (4), of Louisville, Ky., in referring to differences of professional opinion on the subject says: "But experience is our best teacher," and "in therapeutics careful clinical observation under the use of certain therapeutic measures is our safest and surest guide toward therapeutic progress and the lessons taught by experience are often just the reverse of what was expected." He was one of those who "had accepted the belief that, in the treatment of extensive acute infections with high temperature, vaccines would be theoretically contraindicated," but he had "found the reverse to be true; that instead of being contraindicated our very best results are obtained in just this class of cases." He believes that a toxic condition as the result of infection does not necessarily imply that the substances which are responsible for the toxemia are of the kind which will favorably influence the resistance of the patient, and that the essential requirement under such conditions is the immediate application of a stimulus which will arouse the defensive forces for the development of suitable antibodies.

Laferty further states "that bacterial vaccine injections do not increase the toxicity of the patient, when given in extensive acute infections, which is readily determined by a careful observation of the temperature curve and the pulse rate. When given under high temperature conditions no appreciable rise in temperature will follow a vaccine injection, nor do any other unfavorable symptoms develop which can be ascribed to the vaccine injection. But, on the contrary, as a rule it will be found that the temperature will come down, the pulse will improve, and other toxic symptoms will start to abate within twenty-four hours provided the proper vaccine in a sufficiently large dose has been given before the infection has advanced sufficiently to cripple the responses of the patient. Usually this will hold good during the first few days of the infection; but the best results are obtained if the vaccine is given soon, within a day, after clinical symptoms show the presence of an active infection."

The author goes on to emphasize the importance of early and frequent doses. He says: "In severe acute infections where germ development is extensive, antibodies are used up rapidly. A small area of tissue where the vaccine was injected may become actively engaged in the production of antibodies;

but, as a result of toxic materials distributed through the system from the infecting organisms, these activated cells may in time become fatigued in this capacity; then, after a short spell of clinical improvement, often so dramatic that one is inclined to think the trouble is over with, and the case is allowed to drift along until within three or four days the condition becomes just as bad as before the vaccine was given, and not uncommonly when this condition develops the vaccine will not produce the striking results that the first dose did; meantime, as a result of accumulated toxemia from the progressing infection, the cells of the body have become less responsive to the antigenic influence of the vaccine. For these various reasons it is very important that inoculations should be made at comparatively short intervals in extensive acute infections, so that another immunizing response will have time to develop from newly involved tissue at the site of injection before the immunizing influence from the previous injection has had time to wear off. Clinical experience indicates that this is best accomplished by giving the vaccine at daily intervals until the temperature shows a distinct tendency to remain down, but it is never wise to give less than two or three injections at daily intervals, even if the temperature does come down to normal meantime. After a normal temperature is obtained inoculations should be made at two to four day intervals until convalescence is complete. In extremely bad cases it is advisable to give the vaccine twice daily until the very severe symptoms are brought under control."

The system of doses recommended above is in marked contrast to that originally advocated by Wright (5). A dose table was published soon after Wright's papers first appeared, said to have been devised by Wright himself to designate a safe arbitrary initial dose for each bacterin; subsequent doses to be increased gradually. If, following any dose, a clinical reaction should occur, characterized by rise in temperature and aggravation of local symptoms, a general malaise, etc., it was directed that the same or a smaller dose should be given. In regard to frequency of dose, it was directed, as a general rule, that the intervals between doses should usually be from two to four days in acute cases, and from two to seven days in chronic cases. As certain persons manifested hypersensitiveness to bacterial proteins of various kinds, resulting in severe reactions even when small doses were employed, some physicians were in the habit of commencing with a minute dose as "a feeler" and then proceeding in the regular way if no special sensitiveness appeared to be present. It is evident that the two systems of doses are capable of producing very different clinical results, and that tests should be made, under proper controls, to ascertain which system is preferable.

IMPORTANCE OF EARLY TREATMENT.

W. H. Wynn, whose contributions to the subject of bacterin therapy are widely known, urges (6), that with certain acute infections "there is a margin of time during which it is possible by suitable intervention to cut the disease short." He says: "If a *laissez faire* policy is adopted and this opportunity passes, the patient's fate, in so far as it depends upon a conflict with the invading germs, is committed to chance; that with such infectious diseases as measles and scarlet fever [where the cause has not been determined—*author*] we cannot at present offer anything better than the expectant method; but with acute lobar pneumonia, influenza, cerebrospinal fever, typhoid fever, whooping cough, and diphtheria, specific treatment can be applied as soon as diagnosis is made out." Referring to acute lobar pneumonia, the author says: "The use of a suitable vaccine during the first few hours after the onset of the fever gives brilliant results. With each hour that passes success is less easily obtained. There is an exact parallel with the results of antitoxin treatment of diphtheria or the operative treatment of appendicitis in this respect."

IMPORTANCE OF ADEQUATE DOSES.

Wynn emphasizes the importance of adequate doses. The bacterin was a polyvalent bacterin containing equal number of pneumococci, streptococci and influenza bacilli. He recommended the following doses: "For an adult man, eighty to one hundred millions; for an adult woman, sixty to eighty millions; for a child of twelve to fourteen, forty to fifty millions; for a child of two to three years, ten to twenty millions."

The author says: "I have several times repented of giving too small a dose and have only obtained an effective response on increasing. . . . In influenza I have not ventured above one hundred millions, although in acute pneumonia I have given above one hundred millions."

Dr. Wynn's paper is a very comprehensive report of experience in the treatment of a large number of patients with acute infections. It contains many important statistics, is illustrated by clinical charts, and is worthy of thoughtful consideration.

SENSITIZED BACTERIAL VACCINES.

A sensitized bacterial vaccine, as defined in Dorland's *Medical Dictionary,* is "an emulsion of a bacterium which has been treated by the application of the corresponding immune serum." Since, in the case of immune serum, a rapid (immediate) but transitory immunization is possible, and by the use of bacterins a slower but more permanent immunity is brought about, a combination of the two agents was sought.

Ehrlich and Morganroth (7) demonstrated in 1899 that bacterial cells absorb their specific amboceptors (antibodies) from immune serum. In 1902, Besredka (8), proposed a new method for preparing sensitized vaccines by exposure to immune serum. Besredka's conclusions at that time were as follows: "Immunizing with serum (passive immunity) is rapid and inoffensive, but fleeting. The immunity conferred by the bacterial bodies themselves is of longer duration but is established only after eight to twelve days, during which the resistance of the organism is enfeebled, and the injection is accompanied by local and general symptoms. The immunity conferred by sensitized vaccines (antiplague, anticholera, and antityphoid) is of longer duration. It is established in from twenty-four to forty-eight hours, during which the organism is reinforced, and the injection is not accompanied by appreciable local or general phenomena."

According to Besredka, a view concurred in by

Gordon (9), "the object of sensitizing bacteria is to promote their phagocytosis, and the effect of sensitization is to accelerate the immunity by shortening the preliminary work of the phagocytes and causing them to deal at once with the endotoxin of the invading bacteria."

Whether Besredka's and Gordon's conception of the mechanism of the action of sensitized bacteria is entirely correct, in assuming that immediate phagocytosis is the determining factor in the rapid production of immunity and the neutralization of the infecting bacteria, or their products, the observations of a large number of workers, both in experimental animals and the human, show that reactions, both local and general, are eliminated or much diminished.

The observations on experimental animals in the research laboratories by Corsa, Craig, and Richards working in cooperation with Huntoon (10) show that a properly sensitized bacterin carries with it a certain definite antibody charge, some of which, upon injection into the animal body, is promptly set free and confers a degree of immediate passive immunity upon the recipient. This passive immunity commences at once to decrease in potency, but persists during the period of the socalled negative phase of Wright, and continues until the tissues commence to respond to the stimulation of the injected bacteria, producing new additional antibodies which now take the place of the injected antibody, so that the injection of such a sensitized bacterin combines the advantages of some immediate passive immunity with an active immunity which persists some time.

ADVANTAGE OF SENSITIZED BACTERIAL VACCINE OVER BACTERIN PROPHYLAXIS.

The preceding statement refers to the effect of a single dose of sensitized bacterial vaccine administered to an animal for the purpose of observing the character of the immunizing response. In the practical application of sensitized bacterial vaccine for combating an epidemic of typhoid fever, for example, the method is to administer three to five gradually increasing doses at intervals of three to seven days. Each dose increases both passive and active immunity—the short intervals between doses, by setting free repeated charges of antibodies, augmenting the passive immunity, the injected bacteria repeatedly stimulating the body cells to produce antibodies, thus increasing and building up the active immunity. This method is in marked contrast to the one employed in immunizing with three doses of unsensitized bacteria at ten day intervals. No immunizing response follows the first dose until the lapse of six to eight days; no passive immunity is produced for the protection of the vaccinated individual during the interim, nor for additional protection during the interim between the second and third doses. The advantage of sensitized bacterial vaccine over bacterin in combating an epidemic of typhoid fever is thus apparent.

ANTIBODY SOLUTIONS.

During the investigation by Huntoon on the separation of antibody from sensitized bacteria it was discovered that the injection of sensitized organisms into animals was followed by an immediate passive immunity, varying with the dose and amount of antibody set free in the animal. The problem suggested itself to separate and secure antibodies in solution outside of the animal body.

Huntoon continued his investigation on the production of antibody solutions free from serum protein, that could be employed therapeutically. In this he was finally successful. The method discovered was applied to the production of pneumococcus antibody solutions, as follows:

Horses were injected at regular intervals with emulsions of Types I, II and III pneumococci. The serum, after a number of injections, developed protective antibodies.

To this serum was added an equal volume of a heavy emulsion of living pneumococci, Types I, II and III. The mixture was placed at 37° C. for twelve hours, and then centrifuged. The sediment was washed with salt solution to rid it of horse serum. The washed sediment was emulsified in salt solution containing 0.25 per cent. sodium bicarbonate and heated to 55° C. for from thirty minutes to one hour. This caused disassociation of the pneumococcus (antigen) and antibody. The mixture was then centrifuged, and the supernatant fluid removed, chilled, recentrifuged, and finally filtered through a filter candle. The final solution, which contained only 0.035 mg. of nitrogen to the cubic centimetre, was, in many lots prepared by this process, able to protect mice against as many fatal doses of pneumococcus Types I, II and III as the orginal serum from which it was made (11).

When the research on pneumococcus antibody solutions had reached the stage where reasonable amounts could be produced, having a potency against the three fixed types of pneumococcus, approaching that of immune serum, clinical cooperation was secured for the testing of the solutions.

Such material, however interesting from the academic viewpoint, can only be useful if clinically available, and a complete and unbiased test could be the only method of determining its value.

The laboratory and clinical research were entirely separated, the material being turned over to the hospitals in the quantities requires, the physicians in charge agreeing to report on the cases in which it had been used, whatever the result.

OTHER FOREIGN PROTEINS.

Foreign proteins play an important part in the etiology of hay fever, bronchial asthma and various cutaneous diseases. Success in this field attending their use as diagnostic, prophylactic and therapeutic agents is attracting considerable attention in medical circles both in this country and abroad. Their employment rests upon the same principle as those upon which the use of the protein substances already referred to is based, namely, the principle of antigen-antibody reaction.

These tests were conducted in the wards of Bellevue Hospital, New York, by Dr. Russell L. Cecil and Dr. Carl Neil Larsen, working under a cooperative arrangement between Bellevue Hospital, the Influenza Commission appointed by the Metropolitan Life Insurance Company, Cornell University Medical Department, and the United States Public Health Service. Tests were also conducted in the wards of the New York Hospital by Dr. L. A. Conner.

The author's references will appear in his reprints.

General Theory of the Neuroses

By ALBERT POLON, M.D.
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PART III.

CLASSIFICATION OF THE NEUROSES.

One in quest of a classification of the neuroses, approaching psychoanalysis in the hope of finding therein a settled system of grouping of types of mental disease, is bound to meet with disappointment. Psychoanalysis does not work with rigid formulation. Its concepts are not sharply delimited; in this regard it shares the characteristics of every new and growing science. Its main work thus far was concerned with the description of empirical data. Of course this description was carried on in the light of certain abstract ideas, which were also applied for the purpose of correlating these data. Unavoidably these ideas must be in a certain measure ill defined in order to facilitate their adaptability to the ever growing material they deal with.

One of the main prerequisites of the psychoanalytical attitude of mind, is a forbearance toward the unsettled condition of the material it deals with. In but few things has the last word been said. There must also be preparedness for a change of concepts or of formulations in the light of accumulating experience. "Progress of knowledge does not tolerate rigidity of definition" (Freud). This consideration applies with especial emphasis to the matter of classification.

Before all, the psychoanalytical criteria of what does and does not constitute a sound mental state are not sharply drawn. Generally speaking the concept of a normal adult may be expressed in terms of an expedient distribution of the libido. In such an individual we would find a balance of the libidinous charge apportioned between the various phases of the personality. First, his ego would correspond to the cultural level of his social environment, by having created in it the prevalent standards of morality, shame, disgust, conscience, sense of reality, judgment, logic, etc. Secondly, he would have a certain number of sublimated libido activities, such as love and interest in work, active association with his kind, an impulsion for service, love of nature, artistic, scientific, and religious pursuits, devotion to family group, or national interests. Thirdly, a certain amount of his libido must find its consummation in a heterosexual relationship with a person consistent with the level of his own ego and his selfesteem. In addition this normal individual would have no points of fixation in his development—that is, he should show no tendency to regression. Also he would not be marred by a pronounced defect of his organic structures, which could handicap his adjustment. His libido would then be expediently distributed; the gratification attained would not tend to call forth conflicts.

Clearly the pivotal point upon which this configuration rests is that it is acceptable to society, since it represents a successful repression of all those impulsive tendencies which threaten the very existence of culture. Yet an outstanding feature of this criterion of the normal is that it admits of a considerable fluctuation of the limits it sets up, and hence tolerates a large number of gradations of its standards. As for example, excessive religiosity, inordinate idealism, superstitions, are not necessarily regarded as marking an abnormal individual. Because of these gradations there is an imperceptible fusing, or shading off of the mentally sound into the mentally ill. Psychoanalytically, one is concerned but little with the qualitative differences between health and disease. It is the quantitative factor that is stressed. Freud's phrase: *"Ein jeder mensch hat ein wenig neurose"* (Every person is somewhat neurotic) expresses this point of view.

The neurotic differs from the normal essentially in that he has not successfully repressed his unconscious, which under the disguise of symptoms attains a gratification that could not have been otherwise granted, either by his ego or by his social setting. It is true that the neurosis eventually creates difficulties and handicaps for the subject; but its earmark is, that the unconscious craving causing it is sufficiently camouflaged to permit its manifestation without evoking social disapproval, or its equivalent, the disapproval of the socialized portion of the personality of the patient.

Society forgives and tolerates anything which bears the imprint of effort to hold the unconscious in check. Upon this ground the neurotic lays claim to and is accorded social sympathy. However, this sympathetic attitude is prone to change rapidly, as soon as the masking becomes transparent. From this point of view one may say that in the neurosis the problem of social conflict plays a rather unimportant part; in fact, the neurosis has been brought about in order to avoid it. This elimination of conflict by means of the camouflage of the unconscious is just as effective in the neurotic himself. He found a compromise formation between his censoring functions and his tabooed cravings, in symptoms which disguise for him their nature. The neurotic would be in need of this mechanism of concealing even if he lived outside the social pale.

Whereas the elimination of conflict is the primary work of the neurosis, in psychoses the situation is entirely different. There the subject is spared the internal conflict by the removal of the censorship, but the laying bare of his unconscious places him in a position of being a threat, and intolerable to society. The main characteristics of the psychotic, his being a social burden and a danger, his incapacity for *en rapport,* his diminished relation to reality, and his lack of insight, all these are the expression of a person who uncovers his unconscious to society.

Thus, the normal, neurotic, and psychotic are concepts based principally upon the rôle that the unconscious plays. This rôle, its scope and intensity, depends upon the quantity of the libido accorded to it from the foreconscious and consciousness. The more libido is detached from the latter two, the more of it accrues to the unconscious. Listening to the rambling of a psychotic is to pay a visit to the unconscious. In the neurotic one sees it disguised behind the symptoms. In the normal one sees it made powerless through sublimation and reaction formation.

It would perhaps stand repetition, that these categories are elastic and fluid, gradually shading off one into the other. It is because of this, that neurotic and psychotic diseases do not lend themselves to a grouping of sharply delimited entities; and this apart from the fact which Freud has emphasized, that in mental disease one has to reckon with the disease process itself, the reparative phenomena, and remnants and rests of the formerly normal state. For this and the preceding reason a rigid classification of clearly defined types of mental abnormality is hardly to be expected in the present state of the material. Nevertheless, psychoanalysis is guided by two main principles of classification; one determined by the magnitude of the precipitated trauma and the other by the tendency to regression.

In our discussion of the etiological factors of the neuroses, we have stressed the importance of the process of regression to points of fixation of the libido. In doing so room was left for a misunderstanding regarding the rôle of the accidental or precipitating factor at the time of the outbreak of the disease. We have stated that the last event which calls forth the neurosis is merely the last straw that breaks the camel's back. This is true in such diseases as hysteria, compulsion neuroses, and schizophrenic psychoses, which constitute the bulk of the psychiatric problem. But there are also clinical entities in which the regression plays only a subordinate part, and in which the accidental trauma overwhelmingly represents the overload under which the balanced distribution of the libido becomes disorganized. The patient, otherwise well adjusted, may be confronted by an actual situation which, proving to be beyond the limit of the elasticity of his organization, will undergo a change varying from a slight deviation of his makeup to a profound psychotic alteration. A neurosis then can arise under the overweight of an actual contemporaneous experience. Such a neurosis is termed true. Its distinctive mark is negatively the subordinate part that regression plays in it. Its pronounced feature positively is the fact that the pathogenic event induces actual pathological changes in the organs, such as congestion, stasis, tension, interfering with normal functioning. Besides the impaired efficiency due to this interference, there is also associated an at first unmotivated anxiety, which arises whenever an organism finds that its libido is not in a condition of adequate distribution.

In the light of this criterion of the primary somatic change, the three diseases, neurasthenia, anxiety neuroses, and hypochondrias have been designated by Freud true neuroses.

Neurasthenia has for a long time been a gigantic waste basket from which by degrees clinical entities, such as hysteria, compulsion neurosis, and anxiety neuroses have been differentiated. Under its vague meaning were embraced all sorts of organic conditions, which later were found to be commencing stages of organic ailments, such as general paresis, neoplasm, arteriosclerosis, endocrinopathies, etc.

Psychoanalytically, neurasthenia has a restricted meaning in terms of its specific etiology, namely masturbation. The stand that psychoanalysis takes regarding the etiological significance of masturbation is midway between the extremes of the prevailing views. These extremes, as you know, are to the effect that masturbation is an extremely noxious agent, even when practised moderately; the other, that it is in itself harmless, and is to be regarded as a symptom rather than as a cause. Guided by observation, psychoanalysis regards masturbation, when practised excessively, as the cause of neurasthenia, that enigmatic entity which is characterized by fatigability, mental and physical, dyspepsia, spinal pressure feeling, frequently by low blood pressure, etc.

Freud's conception of the normal sex function illuminates the genesis of neurasthenic symptoms. In the sexually ripe male organism probably there is being produced, continuously, the somatic sex excitation which becomes the stimulus of psychic life. This somatic excitation, the result of visceral function, is able to reach the cortex only after it passed over a certain threshold maintained by an insulation of the conducting pathways. Having reached the psyche, various ideational groups are energized by the libido, which are set in motion for the removal of the created tension. A good deal of this energy is utilized for the intrapsychic organization, such as the ego, a large amount of it is directed to sublimated sex activities, but a certain quantity of this energy can be unloaded only by means of a specific adequate action. This for the male consists in a complicated spinal reflex act, preceded by an efficient psychic preparedness. Masturbation is a shortcircuiting of this process. With the slightest stimulation the libido is driven into a channel of outlet which does not aim at a change of the outer world, so characteristic of the higher organisms. The outlet in masturbation is found in the body itself. Freud termed reactions of this sort, which transpire only within the organism, as autoplastic, in contradistinction to the alloplastic, that is, those which express themselves in attempts to change the environment. This shortcircuiting of the libido in masturbation is followed by a diminution of the tone of the entire personality; mentally and physically there is a reduction of vigor, initiative and capacity for exertion. An actual defect of organic function underlies neurasthenia, hence it is termed a true neuroses.

The damage resulting from this practice is in two directions. On the one hand there is a lowering of efficiency, and on the other it often engenders a conflict in the subject. Many masturbators seriously injure their psychosexual apparatus so that they are disabled to carry on a normal sexual life—they suffer from impotence, ejaculatio precox, etc. The conflict and the inefficiency may in themselves give rise to another neurosis, such as hysteria or compulsion. That is why neurasthenia rarely occurs in its pure state. There is always an admixture of signs belonging to other neuroses. Clearly the most important side of the therapeutic approach is on the side of prophylaxis and of suspension of the practice of masturbation.

The second clinical entity classified as a true neurosis, and yet distinct from neurasthenia on the one hand, and from hysteria on the other, is anxiety neurosis. Its chief features are hyperesthesia of the special sense organ, general irritability, unmotivated anxiety—a tendency to anticipate the most untoward outcome of the most innocent occurrences, and spells of sudden anguish without any special ideational content preceding it. As a rule the spell is associated with a feeling of an impending calamity, death, dreadful disease, or insanity. With this anxiety there are usually associated functional disturbances of respiration, circulation, vasomotor and glandular innervation. Now one, now the other may be emphasized. Frequently the whole of the neurosis may express itself in a rudimentary form, in which the only pathological manifestation is that of one or another bodily function, such as palpitation, digestive disturbances, excessive sweating, diarrhea, vertigo, vasomotor edemas, and spells of paresthesia. Then again the whole anxiety may express itself in pavor nocturnus attacks, in the adult. An important clinical form of anxiety is that associated with spells of vertigo, loss of equilibrium, or even fainting. The anxious anticipation may lead to formation of phobias, such as those pertaining to animals, thunder, darkness, etc., or those that pertain to locomotion termed agoraphobia. Many of these symptoms may become chronic, and be the only rudimentary indication of the anxiety.

These symptoms have been observed by Freud in relation to a special etiology. In females it is found in virgin adolescents, in the newlywed woman, who is sexually anesthetic, in married women whose husbands suffer from ejaculatio precox, are impotent, or practice coitus interruptus, in the abstaining widows, and in women during the climacteric rise of the sexual appetite. In the males anxiety neurosis is observed in total abstinents, or in the engaged man who frustrates his excitement, or in the married man who practices coitus interruptus, or in men of advanced age whose potency did not keep pace with their libido. Finally, both male and female neurasthenics, upon giving up the practice of masturbation, manifest anxiety. They have become especially unable to endure abstinence.

The whole syndrome of anxiety neurosis, the mental phase of anxiety as well as the disturbance in the bodily functions, is engendered by the damming of the libido. This conception is confirmed by the fact that the analysis of this clinical entity does not reveal any other basis, and also by the fact that correction of the errors of sexual life enumerated above leads to a rapid vanishing of the symptoms.

This neurosis offers the opportunity for the understanding of neurotic anxiety in general. Anxiety is clearly related to fear. Fear, anxiety, and fright are terms for types of affective reaction, frequently used synonymously, but they have been assigned a definite connotation in psychoanalytical literature. Fear is used to designate an affect called forth by a threat coming from the outside world. One fears a bear, a dangerous crossing, or an impending calamity. Anxiety is the preparedness of the organism to meet the threatening danger. It is an anticipation of it. As such it has a definite biological function. Fright is the being overwhelmed by fear without the preparedness of anxiety. Such is the meaning of anxiety when applied to situations which arise in reality, and as such are to be classed as normal.

But anxiety can also arise under conditions where the anticipated danger is not without, but within the organism. An intense tabooed craving, not approved by the ego, is reacted to as if it were a source of danger. The anxiety is a preparedness to meet the obtruding threat. At first this anxiety is undifferentiated and unmotivated. In such a condition it is expressive of the free floating state of the libido. Later on it may attach itself to special ideational systems, and losing its free floating character becomes, what is clinically termed phobia.

The mechanism, by means of which the free floating anxiety is harnessed on to things of the outer world, is termed projection. As long as the subject is experiencing the threat from within, he cannot make use of his psychomotor apparatus for purposes of flight or protection. There is no way of relieving the state of tension created thereby. But when he projects his anxiety outward, that is, when he begins to be anxious about snakes, thunders, calamity of business, etc., he accords himself a relief by the exercising of his psychomotorial functions. All phobias thus represent a reparative process, tending to anchor the free floating libido.

These considerations of anxiety help to understand why it occurs so often in mental disturbances, since in every mental disturbance there is always some unattached libido. Secondly, in this light the relation of anxiety neurosis to anxiety hysteria becomes comprehensible.

What is of interest here is the fact that anxiety can be induced by purely organic conditions. This is surely the case in anxiety neurosis which comes and goes with errors in sexual life, such as those mentioned above. The regular effective therapeutic procedure of this disease is the discontinuance of the subversive practices, such as complete abstinence, coitus interruptus, frustration of sex appetite, etc. The genesis, as well as the mode of its correction, via the soma, places anxiety neurosis among the true neuroses.

The third disease designated as a true neuroses is hypochondria. Hypochondria resembles the feelings and mental state accompanying organic afflictions. Every sick man detaches his interest and his object libido from the outer world and places it immediately upon himself during his ailment. The foremost point of interest to him would now be the diseased part of his body; and it is well that he does so, for otherwise the restitution process would be delayed. This is equivalent to saying that a libido transference is necessary even in cases of organic disease.

The hypochondriac does exactly the same thing. His mind is centred upon one or more organs. The difference, however, from the condition of the organically ill, is that in hypochondria there is no demonstrable gross pathological change; and yet there can be but little doubt that the basis of his paresthesias, dysesthesias, etc., are circulatory changes. A consistent feature of the hypochondriac is the fact that his libido is devoted but little to objects. Its bulk is in the body of the patient, inducing congestive states. The congestion and tension thus induced stand in relation to the erogenic qualities of the various organs. In a large measure the hypochondriac, having abandoned the objects for his libido, and with that normal psychosexual activity, genitalizes other organs than those suitable for the reproductive function. The organically sick man gives up his autoerotism, in connection with the diseased organ as soon as he recovers, because a good deal of his libido is objective. The hypochondriac, not able to maintain his libido in the outer world, finds himself compelled to reckon with its effects within his own body.

The anxiety associated with the sensory symptoms in hypochondria is the manifestation of the free floating libido not anchored by the organs. In proportion as the hypochondriacal anxiety increases and calls for a psychic elaboration, to the fore begins to come the picture of schizophrenic psychoses, or as Freud called it, paraphrenia. Hypochondria bears about the same relation to narcissistic psychoses as the other two true neuroses bear to hysteria and compulsion neuroses.

This group of true neuroses, apart from the pragmatic value of their being thus classified, is of great theoretical interest. They are instances of bodily changes, induced by abnormal psychosexual function.

We have perhaps devoted an undue amount of time to the consideration of the true neuroses, since the topic of this presentation is the subject of classification. But, since in the previous article, on the genesis of neuroses, the regression element has been stressed, perhaps to such a degree as to obscure the significance of the true neuroses, it was deemed advisable to dwell upon the true neuroses somewhat more extensively than our theme would ordinarily call for. With this digression into the first group of neuroses, called the true, we shall proceed with the attempt to classify the rest of the neuroses, constituting the bulk of the clinical pictures of mental disease.

A neurosis which is not a true neurosis, in the sense in which we have indicated above, is a regression neurosis. In the light of previous remarks, a regression is a reversion to a fixation point of development of the libido. In this process of regression, one has to distinguish, first, the depth of the reversion, and second, the quantity of the libido reverted.

You will recall that the developmental course of psychosexuality, even in the normal, is marked by special stages. These are: First, the autoerotic stage of the first year of life in which the mouth region plays a predominant rôle as a source of gratification. This stage is also termed autoerotism. The mental processes expressive of the dominating impulses of this period are termed narcisic. The name, first pregenital stage, is also applied to this epoch.

The second stage of development of the libido, lying anywhere between the second and the fourth year of life, is marked by a still persisting tendency of partial impulses to manifest themselves autonomously. These libidinous strivings are not homogeneous as regards the content of love and hate. In other words, they are ambivalent. The body area acting as the source of excitation is foremostly the rectal and urethral openings. The sadistic impulse plays a conspicuous rôle.

The third or last stage of infantile sexuality, termed the stage of genital supremacy, is characterized by the surrendering of the excitation quality on the part of all erogenic zones to the genital area. This condensation of the erogenic zones into a unity, is paralleled by a well marked tendency to attach one's love life overwhelmingly to one person, usually one of the parents. This stage is also called the stage of object libido, but the objective tendencies of the libido also mark the second stage.

The development of the libido thus proceeds in two distinct directions. One direction is towards the formation of a hierarchy of the partial sex impulses, finding its expression in the adult sex impulses; and the other direction is of a gradual relinquishing of one's own body as an object of the libido and the application of the love striving to an outside object or person.

It should also be borne in mind that these stages are not sharply delimited; they override each other. Characteristics of an earlier period are found in a later one, and vice versa.

A regression taking place to any of these stages emerges in a mental configuration which bears the imprint of the depth to which it descends. It is also clear that in no case does the total amount of the libido regress. Some of it may remain attached in a normal way. And then again not all of the regressed libido remains at the point of fixation. Restitution phenomena take place. The regressed libido may make an attempt to return to reality. These attempts, of course, will be stamped with qualities of the fixation points from which they issue. They will be compromise formations. Thus, the formation of the neuroses depends upon the regressed libido and upon the restitution efforts.

FIRST GROUP OF REGRESSION NEUROSES.

The first group of the regression neuroses are the psychoneuroses, also termed transference neuroses. In these, the regression takes place to the second and third stages of the infantile development. Accordingly, the unconscious fantasies of these ailments are bound up with a person who played an important libidinous rôle during the childhood of the subject. This fantastic devotion to a person in the past is rather elastic and is capable of being transferred to some person in the reality of adult life. Because of this quality, so helpful in psychotherapy, these neuroses are termed transference neuroses. The designation psychoneuroses is derivable from the fact that they are psychogenic in origin.

In spite of the fact that the third stage of libido development is characterized by the genital supremacy and by the objective character of the love striving, the child at that age is not capable of carrying on a normal psychosexual activity. Under inordinate stimulation various parts of the body participate by way of substitution. The hysteric returning to that stage manifests the tendency to genitalize various sensory motorial and secretory mechanisms for the obtaining of the unconscious gratification. The hysterical bodily symptom is a symbolic presentation of the heightened erotic rôle which a particular organ played at the time of infantile activity. As such, the symptom is expressive, on the one hand of regression, and on the other, of restitution efforts, embraced under repression. The quality of the hysteric to genitalize various parts of his body has been designated by Freud as conversion. It constitutes the distinctive feature of hysteria.

However, not always does the entire quantity of the regressed libido become localized in the conversion phenomenon. A good deal of it may remain unattached, and as such, would manifest itself as a free floating anxiety. The unendurable state of unmotivated, or as it has been called, free floating anxiety, calls for its anchoring. This is accomplished by a displacing of anxiety to some external object, giving rise to phobias. Conversion hysteria, as a rule, is mixed with anxiety symptoms, and the syndrome is termed anxiety hysteria.

In compulsion neuroses the regression takes place to an earlier stage, the second stage of pregenital organization. The object choice is present. But there is no supremacy of the genital zones, nor is there a condensation of the partial impulses, nor is there a heterosexual differentiation of the object. The rectum and urethral openings play an important rôle. The ambivalence of feeling is prominent. The sadistic strivings have not yet receded. The object is often homosexual. Obstinacy, lack of readiness to surrender anything of one's self, and preoccupation with excreta at that period, reverberate in the doubts; ambivalence, pedantry, and stinginess of the compulsive, whose mental picture is expressive of sadism and anal erotism. This process in the compulsive neurotic transpires chiefly on the level of psychic elaboration. Conversion symptoms generally are absent.

Although the compulsion neuroses represents a regression to an earlier libido position than that of hysteria, the two diseases have one feature in common. The receded libido is objective, and therefore can shift its position from the fantasy on to the analyst, and from him on to the problem of normal adjustment.

Conversion hysteria, anxiety hysteria, and compulsion neurosis make up the first group of the regression neuroses.

SECOND GROUP OF REGRESSION NEUROSES.

The next group of syndromes of regression, termed narcissistic, are characterized by a reversion of the libido to positions of the first and second pregenital stages, namely, autoerotism, narcissism, and anal erotism. The restitution attempts of this descent are made largely by means of the mechanism of identification to projection, clearly representing the infantile mark of the attempts to return to reality. Due to the fact that in those early stages there was a marked disorganization of the impulses, and that the attempts at reconstruction would therefore issue from various fixation points, the emerging mental pictures would be greatly varied.

Prominent among these syndromes are the persecution and egomania psychoses. Here the libido descends to narcissism, homosexuality and sadism. Against these cravings the ego defends itself mainly by ascribing to the outer world the impulses which rage within the subject. Hence, the persecution mania. A certain part of the regressed libido in the attempt at restitution is taken up into the ego with the resulting egomania. The receded libido loses its objective character.

The depression psychoses are a recession to the first and second pregenital stages. The restitution efforts are carried mainly by the mechanisms of identification. After the disappointment in some object choice of reality, the patient introjects the object or person into his ego. The higher levels of the ego, termed ideal ego, rage and storm and condemn the introjected portion of the ego. The self-depreciation and selfdenunciation of the depressive is the evaluation by the ideal ego of that portion of his ego which he has unconsciously identified with some disappointing person. The suicidal tendency is an attempt to kill the one whom he loved, in other words, his love is expressed now in a sadistic form. Revenge is the keynote of the suicidal mania of the depressive.

A complete emancipation from the tyranny of the criticizing and condemning ideal ego manifests itself as the manic phase of the manic depressive psychoses.

Both in paranoia, as well as in depressive psychoses, the regression leads to a reoccupation of positions of oral and anal erotism with sadistic strivings. That much they have in common. The difference between them is that the paranoic seeks relief from the overloading of the infantile position by projection. He storms against the outer world. The depressive, on the other hand, attempts to reduce his state of tension by means of injury to his own person. The taking on of the regressed libido by the ideal ego, resulting in egomania, as well as the seeking of relief from the thus resulting hypertrophied ego by means of projection (world catastrophe) are the chief restitution phenomena of paranoia. The restitution phenomena in the paranoia express themselves in the egomania resulting from the taking on of the regressed libido by the ego. The attempts to change the world (world catastrophe), is an effort to relieve the tension of the hypertrophic ego by means of the narcissistic mechanism of projection.

The generic group of schizophrenic psychoses embrace various forms of regression to various points of fixation in the stage of autoerotism. Even a superficial consideration of their characters would be precluded by the limitations of this paper. The states of acute confusional and of acute catatonic excitement are to be regarded as regression phenomena, in which the restitution process is at its minimum.

In all these syndromes Freud distinguishes, first, a certain residual amount of normalcy; second, the regressive disease processes *per se,* consisting of the detachment of the libido from normal objects and its occupation of infantile positions; third, the restitution efforts which are tinged by the particular point of regression. In this sense the neuroses and the neuropsychoses are compounds of various constellations of the libido distribution, not unlike a mineral composed of various ores. A predominating feature would be the main characteristic; but by describing it alone, one would not convey the idea of the mineral as a whole. It is for this reason that no psychiatric case fits the frame of any syndrome. There is always something more than the syndrome embraces. That something more in the case, which makes it vary from the textbook description, is to be found in the dynamic phase of the ailment, namely, in the restitution efforts. A syndrome is at best a static abstraction. The mental disease is a dynamic process. Its dynamism is derivable from the impulses for reconstruction; from the attempts to return to reality. A psychoanalytical classification, therefore, does not aim at the delineation of morphological entities, but rather seeks to indicate the direction in which the libido impulses operate, and the developmental levels from which they issue. It is with this reservation that these remarks on classification have been made.

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Influence of Glucose on Phagocytosis in Vitro*

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The marked susceptibility of diabetics to various infections has been noted by many observers. No definite explanation has, so far, been made. Undoubtedly many factors operate in affecting the natural resisting power of the individual with a hyperglycemia. We undertook to study one phase of the mechanism of immunity, namely, the influence of glucose, of lactose and levulose, and of acetone on phagocytosis in the test tube.

TECHNIC.

Solutions of glucose, lactose and levulose, in various strengths, were introduced into suspensions of dog's blood. To these and to control tubes emulsions of bacteria were added and the effects on phagocytosis were noted. Chemically pure glucose, lactose and levulose were used to make up stock solutions, ten per cent. of each. The diluent was normal salt solution. After the ten per cent. stock solution was made up it was sterilized. Dog's blood was defibrinated immediately after drawing. Glucose, lactose and levulose solutions of 0.01 per cent. increasing to five per cent. were made up in different tubes of blood, each containing one c. c. The sugar solutions were made up so that the proper amount was contained in one c. c.

The bacteria used were twenty-four hour cultures of streptococcus, staphylococcus aureus, and pneumococcus Type I grown on human blood agar slants. The bacteria were washed off with normal saline. To one c. c. of blood was added the proper amount of sugar in normal saline to make up two c. c. The control consisted of one c. c. of blood plus one c. c. of normal saline. The tubes were incubated for half an hour at 37° C. to allow the sugar to penetrate into the cells. At the end of this period one c. c. of the bacterial emulsion was added to each tube and to the control tube. The tubes were then thoroughly shaken to mix the blood cells with the bacteria and reincubated for half an hour. Smears of the blood were made and stained with Romanowsky, Wright or Skelton's stains.

The bacteria in one hundred cells of each of the preparations were counted and recorded. We found absolutely no difference in the average number of englobed bacteria to the leucocyte in the sugar treated or control blood. These experiments were repeated several times with the same results.

It was then thought that perhaps the acetone, the principle of the ketone body, a byproduct of hyperglycemia, had some detrimental influence on the phagocytes. So we undertook a few series of experiments with acetone dilutions of 0.1 per cent. to 1.0 per cent. Acetone in the concentrations used also had no effect on phagocytosis in vitro.

One series of experiments was made with human diabetic blood. A man, thirty-five years of age, who had been under the observation of one of us (Arkin) had a blood sugar of 0.22 per cent. The same technic was employed as in the previous experiments. The patient was then made to fast twenty-four hours, after which his blood sugar was only 0.10 per cent. The phagocytic function did not vary in the specimen with 0.22 per cent. blood sugar and that with 0.10 per cent.

The figures of sugar concentrations of dog's blood in all the specimens were exclusive of the normal blood sugar content. The dog employed in our tests had 0.14 per cent. blood sugar.

CONCLUSIONS.

1. Glucose in the blood, even in the high concentrations, has no influence on the phagocytic function of the leucocytes and we have reason to believe that it has no detrimental effect on the cells of other tissues.

2. The susceptibility of diabetics to infection is probably due to, a, a more favorable medium for bacterial growth, and b, the increased viscosity of the blood resulting in sluggish capillary circulation with consequent stasis and infection.

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Experiences with Insulin in the Treatment of Severe Cases of Diabetic Acidosis with Impending Coma*

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The unique and spectacular manner with which a severe case of diabetes responds to insulin therapy is of more than ordinary interest. In two of the cases herein reported the patients were *in extremis*. One, a child in whom the grave symptoms developed acutely, one might say within one week, presented terminal stages of acidosis with a picture of imminent dissolution. The second was a diabetic of three years' duration, with a loss of fifty-six pounds in weight and with symptoms of impending coma, such as dimness of vision, extreme weakness, loss of memory, inability to recognize relatives and friends, with a blood sugar of 560 mgs. and a carbon dioxide combining power of 32, large amounts of acetone and diacetic acid and betaoxybutyric acid. Under insulin therapy the response was immediate. In one of the cases the danger was overcome within less than ten hours.

Case I.—I. A., a boy of nine and a half years, was referred to me by Dr. J. Weiss, on April 6th, and it was due to his prompt recognition of the nature of the disease that the patient's life was saved. The history elicited was that some time in February of this year the boy had an attack of influenza, after which he apparently made a good recovery, the only symptom pointing to the development of diabetes being an increase in the frequency of micturition. The boy would void once at night and would ask the teacher once or twice to leave the room during school hours which he had never been in the habit of doing previously. The condition passed unnoticed by the family until the end of March, just a week prior to the development of acute symptoms of acidosis. At that time the patient had lost some weight and was growing weaker. A physician was consulted who made a physical examination of the patient, omitting the urinary examination. The parents were told that the boy was undernourished but otherwise in good physical condition, and did not suffer from any organic disease. The physician recommended forced feeding, particularly starches, fats and sweets. This treatment was carried out for a week, the patient becoming weaker and feebler every day, and lost weight steadily, from sixty-four pounds to forty-eight.

Two days before I saw him he became bedridden from sheer muscular asthenia. When I saw him his pulse was 150, his skin was dry, icy cold and wrinkled, his face had an aged appearance. His tongue was dry and leathery, his eyes were half closed, he had a marked acetone breath, he was so weak that he was unable to turn from side to side or move any extremity. When spoken to he attempted to mumble faintly in an inaudible and unintelligible manner. His urine was full of acetone and diacetic acid and contained 6 per cent. sugar. Carbon dioxide combining power of blood was 28 c. c. per 100 c. c. with blood sugar of 600 mgs.

At 6 p. m. of the same day, the administration of iletin was begun, the initial dose being ten units. There was no change within three hours, we therefore increased the dose to fifteen units which was repeated every three hours until the following morning. The patient was kept warm with artificial heat and was given nothing with the exception of water, tea and brandy in small doses, as much as the patient was able to swallow, as during the first hours it was hardly possible for him to take anything by mouth. Within ten hours after the first dose of iletin (or after a total of seventy units were given) the patient's pulse dropped to 90 and a general improvement, particularly in muscular strength, was noted. The extremities became warm, face flushed and his tongue moist. Later in the day the pulse dropped to 80, the acetone, diacetic acid and sugar steadily decreased. In two days they had entirely disappeared. His improvement was prompt and steady. The iletin was now cut down to ten units three times per day. The patient was placed on a substantial mixed diet, more carbohydrates were gradually added to the fats and proteins, so that within several days the patient consumed fifty grams of carbohydrates. On the second day the patient sat up, but was kept in bed for five days. At the end of that time he had gained eight pounds. Since then, he continues to be sugar free, is in excellent health, participates in all games with his friends and on May 6th, exactly one month after the onset of the treatment, he weighed sixty-six pounds, that is, a gain of eighteen pounds in a month's time.

The further observations in this case brought out some interesting developments. After a month's insulin treatment it became apparent that he required less insulin in order to keep sugar free. Whereas before, during the entire month, he consumed thirty units daily on a diet of fifty grams carbohydrates, seventy-five grams protein, one hundred grams fat, we now found that we could diminish the insulin daily so that within two weeks he consumed but five units daily, even though his carbohydrates were increased to seventy-five grams. Recently the insulin was withdrawn for one week and the carbohydrates diminished to fifty grams. The patient still continues to be sugar free. I believe that here we have a case that presents almost a complete restoration of the pancreatic function.

Case II.—Mrs. M. L., aged thirty-four. Married twelve years, sterile. The family history was negative; father, mother, four sisters, one brother alive and well. The patient had typhoid fever at the age of eighteen from which she made a good recovery.

During the summer of 1919 she was in good health and spent her vacation in the mountains, she gained sixteen pounds in six weeks, weighing then 146 pounds. When she returned in September she began to experience weakness and a constant tired and sleepy feeling. The patient had polydypsia, polyphagia and polyuria, and in spite of these pronounced symptoms no diagnosis was made until the end of January, 1920, when the urine was finally examined and 2.5 per cent. sugar was discovered. Under strict regime the patient lost twenty-two pounds within three months, never fully clearing her urine of sugar. After that she was put on a more liberal diet of oatmeal and she gained five pounds in one week. But soon after her urinary sugar rose from 6 to 7 per cent. She again lost weight and felt extremely weak, when she again returned under strict regime. Since then the patient never rallied. There was a gradual decline in weight and strength. Her urinary sugar varied from 3.5 per cent. to 6.5 per cent. During the year of 1922 an ever increasing acetotonuria developed and later diacetic acid. The patient grew so feeble that she was mostly bedridden, unable to perform any of the slightest household duties and did not have the strength to "turn the faucet." During December, 1922, she began to complain of pain and numbness in the right lower extremity from the knee downwards, the numbness being confined particularly to the outer three toes.

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*Read before the Eastern Medical Society, May 11, 1923.

On January 21, 1923, the patient was brought to me. I found her extremely feeble, her weight was ninety pounds. The casual specimen that morning contained 6.3 per cent. sugar with large amounts of acetone and diacetic acid. Her blood sugar was 560 mgs. The carbon dioxide combining power was 32. The pulsations in the dorsalis pedis and internal tibial in the right foot were scarcely perceptible, in the left they were normal.

Before the administration of iletin an attempt was made with the Allen treatment of starvation, to see what could be accomplished and whether it would be possible to improve her acidosis condition and raise her sugar tolerance, and although this treatment was carried out with scrutinized care, the condition grew worse from day to day, the acetone diacetic acid and betaoxybutyric acid continued unabated, the carbon dioxide combining power remaining unchanged. The patient steadily declined.

On February 1st, we began to administer ten units of iletin subcutaneously three times daily, half hour before meals, the diet remaining unchanged. After the first day following the administration of thirty units of iletin the acidosis completely disappeared and the urinary sugar came down to 2 per cent. On the second day the urinary sugar likewise disappeared and the blood sugar came down to 180 mgs. The patient was then put on a fairly liberal diet including 100 grams of bread, half a grape fruit, 500 grams of vegetables, six eggs, 75 grams chicken, 500 c. c. sweet cream, thirty grams fish, thirty grams butter. The total being 100 grams carbohydrate, seventy-five grams protein, 150 to 175 grams fat, a total of over 2,000 calories. The iletin was continued daily increasing the dose occasionally to twelve and fifteen units a dose. The general wellbeing of the patient promptly improved, the asthenia disappeared, mentality became clear, the pain in the leg and the sensation of numbness disappeared. The patient was allowed out of bed for a few hours every day. Her weight steadily increased at the rate of half pound a day so that within five weeks she regained twenty pounds. At the present time, after three months of iletin administration with an occasional interruption, the patient weighs 120 pounds, showing a gain of thirty pounds.

We found on close study that if we wanted to keep the patient sugar free and with a blood sugar approaching normal it would be necessary to give her from eighteen to twenty units of iletin three times a day instead of ten units as were administered. We could thus ascertain in mathematical figures the exact amount of carbohydrate combustion to the unit of iletin. In order to follow this up more closely and to gauge the combustion influence of iletin to the unit, I conducted the following tests:

On March 1st, the iletin was discontinued for twenty-four hours, and the total quantity of urine collected for the same day, the diet remaining unchanged. The patient voided 2,000 c. c. of urine containing 7 per cent. sugar totaling 140 grams of sugar which was practically equivalent to the total intake of 150 grams of carbohydrate, fifty grams being derived from the protein, thus showing that the sugar tolerance of the patient was zero. This experiment was repeated the following week and the findings were identically the same, the patient eliminating 6 per cent. sugar in 2,500 c. c. or 150 grams of carbohydrate.

During these days when the patient received thirty units of iletin per day she lost from seventy to seventy-five grams of sugar in the urine from a total of 150 grams of carbohydrate partaken, thirty units of iletin had caused the combustion of half the carbohydrate taken in, that is seventy-five grams, the other seventy to seventy-five grams being eliminated in the twenty-four hour specimen. I then gradually and cautiously increased the iletin until on March 8th we doubled the amount of iletin and the patient became entirely sugar free, that is the entire quantity of 150 grams was completely metabolized by sixty units of iletin a day. From this we could deduce that one unit of iletin causes the combustion of two and a half grams of carbohydrate.

I find it best however, to keep this patient on a much lower threshold in order to avoid any complications that might arise from an overdose which might induce the now well recognized symptoms of hypoglycemia, such as nausea, vomiting, syncope and convulsions.

As to the future of this patient with a carbohydrate tolerance of zero it is difficult to conjecture at the present time. I will continue the insulin administration until her weight increases another ten pounds and then discontinue it attempting under dietetic regime to bring up slowly her sugar tolerance.

CASE III.—P. S., aged thirty-two, referred by Dr. J. Fuchs. An ambulatory patient who illustrated a severe type of diabetes with a minus carbohydrate tolerance who had reached a stage where in spite of the low intake of carbohydrate he failed to respond to the older dietetic and fasting regime. His diabetes was of less than a year's duration. Careful treatment produced now and then a temporary standstill of the disease, the condition soon however became beyond control, requiring fasting and other methods. At examination he eliminated large quantities of acetone and diacetic acid, his blood sugar was 360 mgs. and his carbon dioxide combining power was 46.

He presented all the concomitant symptoms of the disease such as marked asthenia, polyphagsia, polyuria, polydypsia, etc.

One week's treatment under insulin therapy convinced me of the severity of his case. With a diet of fifty grams of carbohydrate, seventy-five grams of protein and 120 grams of fat which would give him but 1,580 calories (weight 113 lbs.) he would require over fifty units of insulin a day to keep him sugar free. As he received but forty units a day he still lost between sixteen to twenty grams of sugar in the urine every twenty-four hours. Nevertheless, he gained eight pounds during the first week and I shall wait for further developments in the progress of his case.

Case IV.— M.F., aged forty-nine, hard working man with a history of diabetes of many years' duration. Of late he had lost twenty pounds in weight and heavy traces of acetone and diacetic acid had developed. His case was of unusual interest. Judging from his low sugar tolerance and the development of the ketone bodies, one would classify this case among the more severe types of diabetes, requiring like the previous cases a large number of insulin units to keep him sugar free. To my surprise, however, I found that one administration of ten units of insulin caused the entire disappearance of acetone and urinary sugar within twenty-four hours. Since then I found that he could be kept sugar free with eight units of insulin and with a carbohydrate intake of fifty grams a day. Whether the insulin had a more potent effect in this case or whether the function of the pancreas becomes partly restored is a question of further study.

CONCLUSIONS.

In insulin we have a substance that prevents coma and death from diabetes but does not cure the disease. It may help to restore the carbohydrate tolerance as in Case I, where an acute pancreatic insufficiency took place. In such cases by giving a complete rest to the temporary disabled pancreas, during which time the patient's life and health are safeguarded, the function of the pancreas may be restored to normal activity. This has not been observed in the adults herein reported.

Aside from coma, insulin is indicated only in those severe cases in which the ordinary dietetic treatment fails to bring a response and in those in which ketosis begins to develop. It has no place and should not be used in the moderate diabetic patient. Here the standard dietetic treatment gives satisfactory results. When used, it promptly restores the patient to a normal standard. Unlike thyroxin, the human economy behaves differently to this isolated internal secretory substance. While in the former, the intravenous injection of one mg. of thyroxin in a case of cachexia strumipriva, will restore the metabolism to normal and will cause it to remain so for a period of two weeks, in the latter unfortunately, its influence is only temporary, the iletin is promptly utilized in influencing mobilization and metabolism of the carbohydrates. The effect is temporary. With each combustion of carbohydrate a definite unit of insulin is consumed and therefore the substance must be administered with every meal. Also, unlike the extracts of pituitary or thyroid this substance cannot be administered by mouth as the digestive enzymes cause its destruction.

In the face of all these difficulties, however, do not let us dwell too long on the pessimistic phase, but let us be reminded of the pitiful and erstwhile helpless state of these patients and ask ourselves what would have become of these patients were it not for insulin. I will quote no less an authority than Frederick M. Allen in his laconic remark, "that insulin is the greatest discovery of the present age."

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The Renal Glucose Threshold and Its Bearing on the Insulin Treatment of Diabetes

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By the renal glucose threshold is meant that concentration or percentage of sugar in the blood which will just barely cause the appearance of sugar in the urine. Its variability especially in disease is very great and even in apparent health the variations are considerable both in different individuals, and, though ordinarily to a slight extent, in the same individual at different times. Its greatest importance is its influence upon the diagnostic significance of the routine examination of the urine for sugar. It is now fully recognized that the presence of sugar in the urine does not prove the presence of diabetes mellitus, nor its absence disprove it. This rather unfortunate clinical fact is due mainly to the variable blood sugar concentration required for the renal excretion of sugar which may be 100 mgms. of sugar in 100 c.c. of blood (.1 per cent.) in one case and 300 mgms. (.3 per cent.) or even more in another. In the first case the glycosuria occurs with a perfectly normal blood concentration of sugar and really has nothing to do with diabetes mellitus, which is essentially a disturbance of sugar metabolism. In the other case the patient, as in one of the cases here reported, may have marked diabetes without glycosuria with a blood sugar as here reported of 300 mgms. (.3 per cent.).

The importance of these clinical observations is accentuated by the advent of the insulin treatment of diabetes, which has already taken its place as one of the great achievements of the present century. With either a very high or a very low renal glucose threshold the urine can no longer be trusted as a guide to this or any other scientific treatment. It offers an obstacle to both the insulin and dietetic treatment which can only be overcome by frequent blood sugar analyses. With the low threshold it is perfectly obvious that any attempt to eliminate glycosuria by dietetic restrictions might be attended with serious or even disastrous results. With a very high renal threshold the disease might march on unrecognized with progressive destruction of the pancreatic cells which furnish the insulin in the patient's normal chemistry, unless the observations are checked by repeated blood sugar analyses. The practical difficulties presented by the very high renal threshold in carrying out the insulin treatment are well illustrated in the second case here reported.

Case I.—Low renal threshold: Mrs. B., aged thirty-seven, was first seen October 17, 1919; the principal complaint was nervousness and back pain. Physical examination showed the thyroid gland slightly enlarged and palpable; heart normal in size, rhythm and sounds, except an undue accentuation of the second sound at the base; heart rate ninety. Abdominal and pelvic examination was entirely negative.

The urine constantly contained sugar ranging from 200 mgms. (.2 per cent.) to 500 mgms. (.5 per cent.). The blood sugar at this time was 110 mgms. in 100 c.c. of blood (.11 per cent.). The patient had a moderately severe grade of hyperthyroidism, the basal metabolic rate November 18, 1919, being plus 37.7 per cent. Many blood sugar and urine examinations were correlated over several months and the renal threshold was found to vary from .11 to .12 per cent. Other blood findings were cholesterol 198; N. P. N. 39 and uric acid 3.3 mgms. to 100 c.c. of blood. This patient improved under a suitable line of treatment, the hyperthyroidism gradually disappearing and the renal threshold gradually rising.

In about five months it was found that .142 per cent. of blood sugar produced a doubtful trace of sugar in the urine and later still, in about one year from time of original examination, it required 178 mgms. (.178 per cent.) sugar in blood to produce a clinically recognizable glycosuria. This is strictly within the normal range.

This case is somewhat difficult to classify. If we accept Joslin's rigid delimitations it cannot be called a case of renal diabetes because of the gradual elevation of the threshold to the normal limit within a period of about one year, and the definite influence which an increase in the carbohydrate intake was always shown to have upon the sugar output. On the other hand, it lacked the leading characteristics of true diabetes such as hyperglycemia, hyperlipemia, polyuria, etc. It seems to me that the glycosuria in this case, which stands practically alone as a carbohydrate phenomenon, is best explained simply by the lowering through some unknown mechanism of the renal glucose threshold to such a degree as to allow perfectly normal blood sugar concentrations to filter through into the urine. It does not seem likely that the hyperthyroidism had much if anything to do with the glycosuria. In this condition there is an increased mobilization of carbohydrates which could not reasonably be supposed to have any influence whatever upon the renal glucose threshold. As a matter of fact the hyperglycemia test (by the ingestion of 100 grams of glucose) did not produce as marked a hyperglycemia as has been recorded by myself (1) and others in the literature, although the glycosuria actually increased *pari passu* with the increasing carbohydrate intake and resulting hyperglycemia.

Case II.—High renal threshold: Mrs. M., aged sixty-six, health always good, except a severe attack of typhoid fever in girlhood. About six years ago while in apparently good health she had an unaccountable attack of general debility which compelled her to remain in bed several weeks. During this time sugar was once or twice found in the urine and since that time had been found occasionally. She first presented herself for examination May 7th, but a previous analysis of a twenty-four hour collection of urine had been made sixty days earlier, in my laboratory, each voidance being collected separately because of a suspicion of interstitial nephritis. This showed a normal range of gravity and not a trace of either sugar or albumin. At the time of my examination she had been partaking freely of carbohydrates, partly due to the laxity encouraged by the findings quoted above, and was excreting in the urine one quarter pound of sugar daily with a concentration of four per cent. The blood sugar at this time was 300 mgms. (.3 per cent.) and the cholesterol 542 mgms. (.542 per cent.). Other findings were as follows: blood, N. P. N., 56 mgms. (.056 per cent.); urea nitrogen, 23.9 mgms. (.023 per cent.), which equals 51.3 mgms. of urea at which time the urine urea was 900 mgms. to 100 c.c. of urine (.90 per cent.). There was a moderate acidosis as indicated by the fact that the CO_2 of the combining power of the plasma was 51.3 volumes per cent. and the pulmonary alveolar tension as determined by the Marriott colormeter method was twenty-five. These observations were not made on the same day. She was placed upon exclusive protein and fat diet and in three days her urine was sugar free and has remained so ever since. After about one week on this diet the blood sugar remained at about .27 or .28 per cent., the urine being constantly sugar free. It would seem in this case that the blood sugar in excess of about .28 per cent. freely filtered through the kidneys, maintaining the blood sugar at about the same level. A little acetone was found in the urine at times but no diacetic acid.

The cholesterol had dropped to 480 mgms.; at this time carbohydrates were added to diet and the insulin treatment begun. It is not my intention to discuss the insulin treatment at this time (which will be taken up later, probably in collaboration with others) further than to point out the difficulties which the high renal threshold presented in the scientific observation of the case. It is worth remarking here, however, that rather severe symptoms of hypoglycemia appeared when the blood sugar was forced down by the insulin to 130 mgms. (.13 per cent.), indicating the physiological adjustment to what is ordinarily regarded as a hyperglycemia. At least the symptoms of hypoglycemia appeared at what is ordinarily regarded as the normal level or really much above the normal level in the fasting state. Perhaps the blood sugar level can be gradually lowered with safety, but it is evident that it should not be done suddenly. It does not seem that there can be any doubt that the renal threshold in this case is about 280 to 300 mgms. (.28 per cent. to .30 per cent.).

The question of the renal glucose threshold deserves more clinical attention than it has received. It has been said that there is no renal glucose threshold, which is of course strictly correct if by the term is meant a constant blood sugar level as a standard of such a threshold. Joslin says (2) that we can hardly speak of a renal glucose threshold in diabetes. While this is true of diabetes it is not true of the individual diabetic patient, although I have found in common with others considerable variation of this threshold in individual cases of diabetes. There are so many factors that may influence or control this threshold, as, for instance, the crystalloid or colloid combination of the blood sugar, functional or organic renal disease, etc., that the question is a very complicated one and for the present we must be content with the determination of the threshold in each case at any given time. Fortunately, this is a simple procedure and the purpose of this paper is to emphasize its clinical importance.

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409 West Main Street.

On the Use of Insulin in Infantile Inanition

By ROBERT L. PITFIELD, M.D.,
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Everyone who has used insulin in the treatment of diabetes is at once impressed with the greatly improved condition of the patient's nutrition. It is thought to be a nutritional hormone, enabling the tissues to combine with the sugar of the blood. Children suffering from athrepsia or other forms of malnutrition are of course badly nourished. Utheim found that the blood sugar of such infants was much reduced and far from being diabetic. The normal blood sugar in healthy infants appears to be about eighty, in athrepsia this may fall as low as forty-five milligrams to the 100 c. c. of blood.

Impressed with the stimulating properties of this active principle of the islands of Langerhans I tried injecting it for a period of time (three weeks) into two young infants under my care, both suffering from malnutrition, with the idea that it would afford a means of combining what blood sugar they had with the tissues in order to improve their condition.

Neither child had previously exhibited signs of carbohydrate intolerance or the experiment would not have been attempted. It would not have been safe. At the time of the experiment they did not vomit, retaining all of the food.

Case I.—The first child, baby D., a malnourished baby of four months, who had been for months in the hospital without gaining much and having a high carbohydrate ingestion and retention, and a blood sugar of eighty-four, was given a daily dose of one unit of insulin for seven days. This was administered the same time that his ten o'clock bottle was given. A prophylactic dose of glucose was given with the first dose, to act as a buffer. His diet was a malt soup preparation with whole milk diluted with water in equal parts, also three drams of melted butter. His caloric intake was sixty-five calories a pound a day.

On the seventh day five hours after his dose of one unit of insulin, he fell into a hypoglycemic collapse, from which he was revived by the administration of sixty grams of glucose by mouth. After all of the previous doses of insulin, the pulse rate was not increased. From the beginning he at once began to gain in weight and seemed happy and contented, being rosier and fatter. In sixteen days he gained sixteen ounces, and his condition was much improved. His blood sugar, four days after the stopping of the insulin, was eighty. He took a daily ration of orange juice, one ounce, in addition to his bottles.

Case II.—Baby B., an undernourished child of five months who had been admitted to the wards because of uncontrollable vomiting, was for this reason fed upon large doses of farina and skimmed milk. His intake was eighty calories to the pound daily, upon which he slowly gained in weight but still was undernourished. He suffered from colic and for this citrate of soda was given in his total food, which was boiled before administration, and vomiting ceased. He also took one ounce of orange juice daily.

After a few days of insulin treatment, I felt that it was only fair to the child to have his milk increased in caloric value and his stomach being retentive I used whole milk instead of skimmed diluted with water as before.

His stools became smooth and colic disappeared. He received a daily dose of one unit for a few days with his ten o'clock bottle. A prophylactic dose of glucose was given with the first dose. He suffered from no shock, but being feeble I reduced the dose of insulin to half a unit. The administration caused no increase in the pulse rate at any time; in seven days his weight increased fifteen ounces. Four days after the insulin was discontinued his blood sugar had risen to 104 (twenty-four milligrams above normal for children). Banting had the same experience with rabbits after discontinuing the administration of insulin.

I made sure that the children did not vomit their food, that they had a large carbohydrate buffer against the blood sugar reducing insulin. How much pancreatic insufficiency plays a rôle in inanition and athrepsia no one can tell; the pancreas, no doubt in common with other organs, is depressed. Perhaps some of the vomiting, distention, and much of the tissue wasting in these cases are due to this default. I presumed that this was the case in these children and therefore gave the insulin.

Under no circumstances should it be used without a large buffer of carbohydrate in the diet or in the blood. While these two cases present scanty data, I report them nevertheless for what they are worth.

Minute doses of insulin given with every bottle might be of some value in many cases of athrepsia. It might be worth trying in selected cases, in an institution where blood sugar estimations can be done frequently and other observations made which would be needed in such cases. It might be considered that I have performed a perilous experiment. It did not prove so, however. The experiment was stopped because I felt that change in diet was needed, and if this was done, the results could not be interpreted as due to insulin.

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The Familial Concurrence of Diabetes Mellitus and Canities Prematura

By HUGO W. TRAUB, M.D.,
Chicago.

Under the influence of the rediscovery of Mendel's forgotten observations by de Vries, Tschermak and Correns less than twenty-five years ago, the factor of heredity in human pathology assumed a new aspect. As the true significance and potentialities of Mendel's great discovery gradually began to break through the carefully cloistered walls of workers in the purely biological sciences, it became apparent that not only would it bid fair tremendously to influence the biological, but the social and political sciences as well.

Sufficient evidence has accumulated to enable one to say that the long known and daily observed fact of heritable qualities and tendencies in organic nature has become to some extent at least susceptible of measurement. This possibility of quantitative treatment must of necessity recast many commonly held notions concerning the relative weights of the socalled exogenous and endogenous factors in the etiology of human disease. In an era still dominated by the genius of Pasteur, this has probably its best expression in a tendency on the one hand to a renewed study of the organism as a whole, that of the constitution or the diathesis concept, or a pure anthropological viewpoint which Paulsen attempted to introduce—the other a renewed focussing of the attention on the original germ cell from which the latter must have proceeded.

Eight years ago two members of a family came under my observation in whose family history diabetes appeared to be an uncommonly frequent affection. The actual incidence was not positively known. Inasmuch as I had the cooperation of an enlightened interest and as it appeared probable that some accurate data might be obtained, I undertook the collection of the complete pedigree.

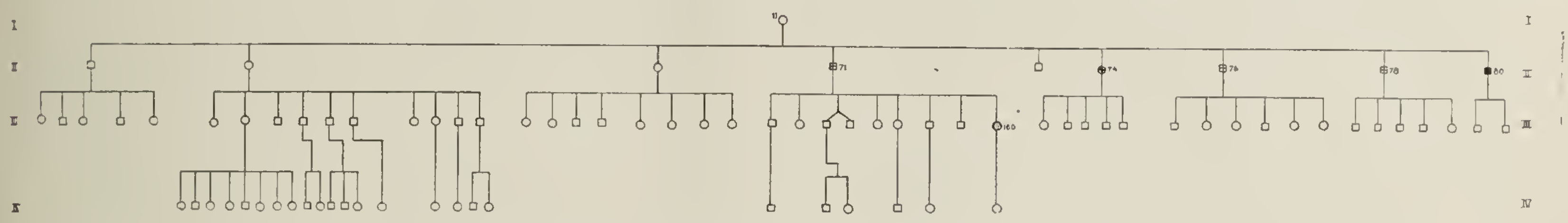
Incident to the collection of these data, it was casually learned that another member of this family who had subsequently died of diabetes, had become strikingly white haired at the age of twenty. When it was later on disclosed that other members of the family had become grey haired while very young, it was decided to investigate this point as well as some other things.

And while the details and proposed statistical treatment of this study, when finally completed, are reserved for another place, let it be said here that I am well aware of the criticism—this not entirely ill founded—of certain experimental geneticists of the scientific value of all such work. While the possible sources of error are somewhat wider than in conventional laboratory work, if certain precautions are taken many of these are avoidable. Chief among such are utter disregard of time and a stubborn insistence on accuracy among one's collaborators, on whom one is necessarily dependent. The biographical data herein used were subjected to the closest scrutiny, and agreement on each pertinent datum from at least two independent sources was required for acceptance.

In the accompanying diagrams is shown the incidence of unquestioned cases of diabetes and of well-marked premature greyness of the hair. For the latter I have so far been able to obtain in three instances at least photographic evidence of this condition in individuals long dead; for the former, while the strict anatomical proof of the beta cells of Allen cannot be furnished, an adequate clinical history has been exacted.

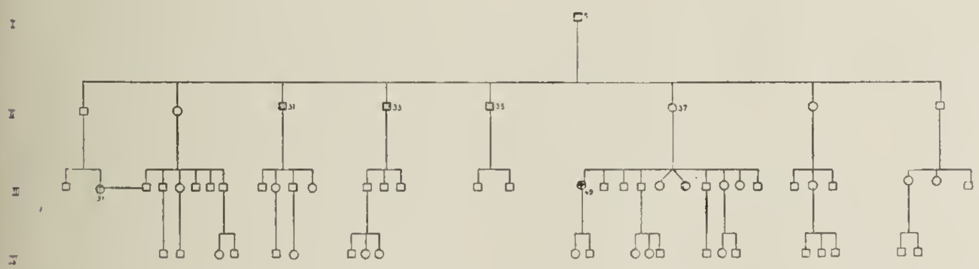
A pedigree showing four generations of descendants of one common ancestor born in 1777, is presented. In this group the first three generations are complete; the fourth being the present children generation, is necessarily a probably growing quantity. As will be noted, the F.1., (first filial) generation consists of seven persons, concerning all but one of whom, all desired data were secured. Three of these were prematurely grey. Inasmuch as all of these persons were born prior to the year 1822, it is very unlikely that—in view of what is known concerning the historical development of the clinical concept, diabetes,—that, even though the same had occurred, it would have been recognized. It has seemed preferable, therefore, to assume nothing more concerning the point.

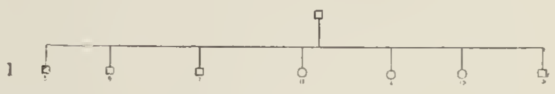
The F.2. generation consists of forty-four individuals, concerning twenty-five of whom all desired data were obtainable. Here we note in the children of I.5. the marked hereditary influence of canities prematura, four of eight having been affected. One of these four, moreover, manifested diabetes, to which he succumbed at the age of sixty-eight. We find, further, among the children of I.9 no canities, but on the other hand one case of diabetes in the only female in that particular group. Death occurred at fifty-six. We next find that among the nine children of I.11, there occurred five cases of diabetes, four having died of diabetes and its complications at the ages, forty-nine, sixty-four, forty-nine, forty-four, respectively, one still surviving. In one member of this particular group (II-80), we note for the second time in the F.2. generation the curious precession of diabetes by the most striking example of canities prematura. Sufficient reliable information concerning the descendants of I.7 and I.1 is still unfortunately lacking, both of these groups being of especial interest owing to the premature greying of the two forebears, as shown.



In the F.3. generation, numbering 148 individuals, concerning 103 of whom all desired data were obtainable, there are two genuine cases of canities prematura, as indicated. One case of diabetes has recently been uncovered, this woman being, as will be noted, the daughter of another who was completely white before attaining the thirtieth year and who had been positively free from diabetes, but succumbed to carcinoma of the breast. It is an ironical coincidence that this same woman—one of two persons most helpful to me in the collection of her family data—was herself within the past year found to have diabetes, only after she had been for a time chiropractically abused for a supposed sciatica. The present mean age of the F.3. generation, however, has not yet attained the period of maximum incidence for the development of diabetes, while it has for the appearance of premature greyness.

The F.4. generation consists entirely of children, none of whom exceeds the age of fifteen, and does not for the present interest us. There is no instance thus far of the occurrence of a case in a juvenile.





The existence of a hereditary or familial factor in the etiology of diabetes has long been known. Blumenbach is credited with first having noted it, and Külz, "whose work fills one third of all the tomes on diabetes," observed a familial influence in approximately one fifth of his cases. With this value a number of statistically treated series are in close agreement, and as a general thing there is no dearth of recorded observation concerning this factor.

However, this is true not nearly to the same extent as premature greying of the visible hair. This is probably due to our being so accustomed to the normal involutional process, that when the scalp and beard hair whitens earlier than is the normal experience, we accord this little clinical significance, if any at all, or indeed regard it as a curiosity. That canities generally may have a physiological mechanism and significance, quite at variance with what has been believed, is suggested b ythe work of Bloch.

It is the present purpose to attempt a theoretical correlation of the familial occurrence of diabetes mellitus and of canities prematura in the same human stock. Of the several possible feasible methods, two suggest themselves: 1, a mendelian manner of treatment, which presumes completeness of data and involves complicated mathematical considerations, usually meaningless to clinicians; 2, one founded on pathological physiological considerations of a biochemical rather than a structural character.

To gain a proper perspective, it cannot be amiss in this connection to set forth the accepted current views, both of the probable ultimate and essential character of diabetes mellitus, and that which is and has long been held to be the intrinsic nature of canities. As for diabetes, Allen, its foremost modern experimental student, has cleared the air and the literature by sharply separating experimentally derived fact from armchair fancy. On the basis of strict experimental considerations he defines the anatomical basis of diabetes to consist of a "hydropic degeneration of the beta cells of the islands of Langerhans, which is specific and due solely to overstrain of the cell function by diets in excess of a weakened assimilative power." Anent the pathogenesis he says: . . . "the humoral stimulus to hydropic degeneration . . . therefore cannot be the excess of blood sugar, but must be something deeper or more specific in connection with diabetes. Though only traces of their internal secretions can be supposed to exist in the blood, it is conceivable that the islands may be sensitive to a deficiency of the circulating hormone itself. This question which suggests a secretory regulation by a principle resembling mass action, as also the possible nervous control by the intrapancreatic ganglia, are matters of pure speculation at present." Allen finally takes his stand with v. Noorden and Martius, when he declares that "existing knowledge warrants dismissing old myths of constitutional or pluriglandular degeneracy" . . . "diabetics should be regarded as normal individuals, who have become afflicted with a definite organic disease." But nevertheless the very fact that there is something—predisposition or call it what we will—which seems to be transmitted more particularly only by and to certain individuals in whom diabetes develops, while in others under similar conditions it does not, justifies the attempts of those committed to a mendelian or other mode of thinking to interpret or seek the ultimate pathogenesis in mendelian or some other terms.

Concerning canities—and more particularly its premature and aberrant forms—we find much more unanimity in the systematic presentation of its clinical behavior than concerning its pathogenesis. Moreover, while one regularly finds various cutaneous complications described in the systematic clinical accounts of diabetes, changes in the cutaneous appendages which might be reasonably expected as well, are not mentioned in the readily available literature of the past fifty years. Von Norden's account of a remarkable change in the form of the scalp hair of one patient is the one exception I have been able to find. Dermatologists are in accord on three points which seem to me to have a direct bearing on the present problem: 1., there is a marked hereditary element in the premature form; 2, there is a disturbance in pigment metabolism; 3, the hair cortex contains gas bubbles. The pigment phase of the question has recently been attacked in a novel manner by Bloch. The "dopa" reaction (dioxyphenylalanin) developed by him and the theory founded thereon offers not only a rational explanation of the mechanism involved in the production of canities but opens a wide field for experiment and speculation. Physiologists have long known that certain enzymes play an important rôle in the oxidation and reduction processes of living organisms, and while enzymes are probably present in every cell of the body (Wells), the specific function of but very few of these has been definitely determined. Bloch believes that he has discovered the function of an enzyme, named by him dopa oxydase, normally contained within the basal cells of the epidermis and those of the hair matrix, in which pigment formation is generally believed to take place. Bloch and his coworkers have demonstrated that the production of melanin is due to an oxidation process locally initiated or accelerated by this enzyme in a mother substance or propigment present in the general circulation. This propigment he believes to be dioxyphenylalanin or a body, closely related structurally to tyrosin, which in turn numbers adrenalin among its very close chemical relatives. That melanin and adrenalin are chemically related substances is of course not a new observation; but it seems a curious coincidence that melanin is so related to a body, whose capacity for the artificial production of glycosuria is well known.

The presence of gas bubbles—more often referred to as air bubbles—in the cortical and medullary substance of the whitened hair shaft has recently again been confirmed in a study of what is possibly a rare variant of canities by Cady and Trotter. While these investigators do not so term the hair anomaly which they studied (ringed hair) and while they conclude that pigment atrophy does not enter into the pathogenesis of that condition, it is of more than passing interest that the nature of the socalled gas globules within the hairshaft engaged their attention. While their further conclusion that these gas globules are probably carbon dioxide does not exactly fit the hypothesis that canities is due fundamentally to a failure of an oxidation process to take place, it will at least tend to furnish a more rational viewpoint than that of the old stereotype, implying that atmospheric air has in some mysterious manner entered the hair shaft.

But what has all this to do with the pathogenesis of diabetes and what conceivable relationship can exist between these two conditions? There have occurred to me at least two means of possible correlation. The one has to do with another well known, just as little understood, but in some respects analogous, heritable process—and one in which a specific enzyme is generally accepted as playing a rôle of considerable importance. Hemophilia, according to Vines, is a ferment deficiency disease, and Osler declares the deficiency to be "on the organic side of the clotting mechanism and not on the inorganic, as, e.g., due to lack of calcium salts." In the light of Allen's previously quoted suggestive remark, relative to an as yet unknown more deep seated factor whose absence or presence induces or inhibits changes in carbohydrate metabolism after the manner of a catalyst, it would seem permissible to think at least of some such mechanism in the ultimate pathogenesis of diabetes. The isolation of insulin brings the solution one definite step closer, but it is obviously not equivalent to a *causa causans*. Whatever this latter may be—whether a substance normally held in physiological balance, or an abnormal one—it is selfevident that in either event it must have its origin somewhere, and this probably extrainsular.

But this does not aid us in interpreting the greater susceptibility of only certain individuals or of certain groups to the development of diabetes, to canities, or for that matter, greater predisposition to noninfectious degenerative processes of unknown origin generally. But while it may appear going somewhat far afield to do so, we find a second possible key in some recent investigations by Guyer of a fundamental biological problem—the doctrine of the noninheritance of acquired characteristics. While this latter is generally considered settled *ex cathedra* —save among a small but aggressive group of neo-Lamarckians—Guyer has once again been led to approach the same through his work on the possible influence of immunity reactions in biological variation. Briefly stated, Guyer and his coworker, E. A. Smith, have been able to show that normal pregnant rabbits, injected with food serum immunized to rabbit lens, can be caused to produce young with certain eye defects. "The most interesting thing," I quote Guyer, "about the experiment was the fact that the eye defects were transmissible to subsequent generations, and inasmuch as the condition could be passed down through the male line alone, it is evident that it is based on changes in the germ cells." We have presented to us then, the "possibility of inducing, directly or indirectly, germinal changes by means of antibodies developed in an animal's own body against tissues taken from individuals of the same species." But not this alone; Guyer showed that "an animal can on occasion produce antibodies against its own tissues when these have become displaced or altered, and that such antibodies can directly or indirectly affect the germ cells." While it is perhaps not possible for me here to do justice to the true inwardness and the conceivable implications of Guyer's significant observations, they are—as a means of furnishing an insight into certain fundamental biological and therefore medical problems—in themselves worth inviting attention to. Moreover, as to their more particular application to the problem in hand, it is of course not possible, owing to our ignorance of the essential nature not only of immunity reactions generally, but of what has been called the "endocrine formula," to do more than to speculate. Nevertheless, the suggestiveness of changes which are capable of being induced in the protein molecule of the gonads remains, and the experimental zoologist and the biochemist may perhaps show us just what, in concrete terms, such apparently unrelated things as diabetes mellitus and premature greying of the hair have pathogenetically in common.

The author's references will appear in his reprints.

The Prescribing of Diabetic Diets

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In the treatment of diabetes regulation of the diet is essential, and there is no reason to doubt that it will always be so. Valuable as insulin may be as a palliative and emergency remedy, it can not obviate the necessity for dietetic regulation, though it may increase the effectiveness of particular diets; in fact, the use of insulin calls for increased care and precision in dietetic regulation. A large proportion of the cases of diabetes ordinarily met with can be treated with a considerable degree of success and comfort by regulation of diet alone.

The dietetic treatment of diabetes has undergone rapid development in recent years without approaching very near to finality. A few years ago this dietetic treatment was limited to restriction of carbohydrate. Then fat was pronounced almost as bad as sugar in the diet, and the dangers of acidosis were emphasized, and we were given safeguarding antiketogenic glucose fatty acid ratios to govern the construction of the diet. Then we were told that a diet with a high fat and low protein and carbohydrate content could be taken without producing acidosis. Widely taught was the doctrine of prolonged starvation and undernutrition. And there were special diet cures, as the oatmeal cure, the potato cure and the milk and buttermilk cures; and diets were recommended in which protein from milk and eggs was favored generally over that from animal flesh. The diabetic dietetic therapeutic needle has pretty nearly boxed the compass.

It is probable that in all the teachings above alluded to some elements of truth may be found; and it is certain that the dietetic treatment of diabetes is too complicated to be standardized; no set or system of diets nor any rigid plan of treatment can suffice; every case is an individual problem. But something to serve as a basis of treatment and a simplified technic for adjusting diets to conditions are possible and desirable.

In the following presentation I deal with the technic of dietetic prescribing in diabetes rather than with the particular treatment of that disease. The prescribing of the diet is the first lesson in diabetic therapeutics which the physician must learn. It is true that the physician often relegates the actual work of arranging a suitable diet in accordance with his recommendation of certain quantities of protein, fat and carbohydrate, to a dietitian, and if the latter has the proper knowledge and experience the result may be satisfactory; but the responsibility rests on the physician, and it behooves him to know how to prescribe the diet himself. A statement of certain amounts of protein, fat and carbohydrate to be allowed the patient does not in itself constitute a dietetic prescription, but only a suggestion to be followed in the making of the prescription. Many other things must be taken into account. There is the fact that all forms of protein are not of equal value in the diet; a protein ration made up of gelatin would be worthless, and one made up of gliadin would be inadequate; and of the animal proteins which alone are perfect proteins and supply easily the nutritional requirements of the body, those provided in some food articles are more suitable to some cases than those provided in other articles. The matter of the digestibility of articles containing food principles may require consideration. The matter of the nonprotein nitrogen content of foodstuffs may possess importance in some cases; the freedom from nitrogenous extractives of milk curd and its lesser susceptibility to undesirable bacterial action in the alimentary tract, especially when given in the form of acid cottage cheese, as compared with flesh, may possess therapeutic significance in some cases. Eggs may possess advantages in some cases and disadvantages in others. The matter of the fats in the diet may call for special consideration of properties and physiological reactions, especially when large quantities have to be given. In order to supply sufficient vitamines, especially of the water soluble varieties, in cases compelling severe restrictions, it may be necessary to practice close selection of foodstuffs. And there is always the alkaline balance to be considered, which may require, in addition to maintenance of the normal alkaline excess in the diet, that extra alkalies be given to offset a pathological acidotic tendency. And it must ever be borne in mind that individual cases differ in ability to digest, assimilate and metabolize, and that other factors besides the diabetic condition may govern the dietetic prescription, and that some of these factors may not affect the protein, fat and carbohydrate requirements as such, but rather the character of the articles in which those food principles are supplied to the patient.

The particular dietetic treatment, which is highly individual, must to a large extent be taught to the physician by his own experience. I desire here to avoid that phase of the subject; but it is impossible to avoid suggesting a certain amount of didactic therapeutics when describing definite diets. The fact that the diets given here are definite and contain particular articles, and the fact that they are placed in particular series, are therapeutically suggestive. Such therapeutic suggestiveness is conceded provided that it be borne in mind that these diets are intended only to serve as a basis for individual treatment, and that no specific effect is claimed for them.

ARTICLES OF FOOD USED IN DIABETIC DIETS.

For convenience in prescribing it is desirable to have the list of articles of food regularly used in diabetic diets comparatively small, but it must be large enough to permit of balanced rations and to allow for a reasonable regard for variety and palatability. Additions to set lists of foods can always be made by special order. In the diabetic dietaries described here the list of foods, while not large, is reasonably comprehensive. Regard for digestibility and general wholesomeness obtains in the selection. The varieties of animal flesh mentioned are limited to the most digestible and wholesome and otherwise desirable of those which are common. While some of the vegetables and fruits mentioned may be difficult of digestion for particular persons, they are generally wholesome, and choice is always possible.

To facilitate prescribing, group names are used to a considerable extent, taking advantage of the fact that many articles of the same class have approximately the same food value. This is particularly the case with the vegetables containing about one gram of carbohydrate to the ounce or thirty-gram portion, with approximately equal protein and fat content. These vegetables are referred to as Vegetables I. cooked and Vegetables I. raw. Vegetables containing two grams of carbohydrate to the ounce are similarly grouped. Vegetables containing more than two grams of carbohydrate to the ounce are left for special order. Fruits are similarly grouped. Certain flesh foods, with obvious fat removed, are grouped under the name, Meat lean. Likewise a selection of fishes which have very little fat, are grouped under the name, Fish lean. A selection of nuts which have approximately equivalent food values are listed as Nuts. The cereal porridges from the various grains are grouped under the names of the grains. Other articles are listed under their proper names.

Lists of articles of foods which the author has found sufficiently large to meet most ordinary needs of dietetic prescribing in diabetes are given in the diabetic dietary (1) and the universal diabetic diet list (2).

CONSTRUCTION OF ORIGINAL DIETS.

The diabetic dietary and the universal diabetic diet list are used in the construction of original diets. The former gives selected articles of food arranged in groups according to the carbohydrate content of one ounce or thirty gram portions and some other considerations. The protein and fat content and caloric value of the one-ounce portions of each article are also given. The groups are arranged in regular order, according to their carbohydrate content, from Group I., which contains no carbohydrate, to Group X., which contains twenty grams of carbohydrate to the ounce.

UNIVERSAL DIABETIC DIET LIST

In Each Portion P	F	C	Cal.	Total No.	PORTIONS GM	OZ		Number in Meals B	D	S	L	EXPLANATORY
gm	gm	gm										
3	0	6	35		180	6	Vegetables I, cooked...					**VEG. I.** cooked Spinach, string beans, celery, asparagus, marrow, okra, pumpkin, dandelion tops, leeks, beet tops, tomato, cabbage, cauliflower, wax beans, sea kale, sauerkraut, brussels sprouts, chard, kohl rabi, egg plant.
2	0	4	25		120	4	Vegetables I, raw					**VEG. I.** raw Endive, lettuce, cabbage, celery, tomato, cucumber, radish, watercress.
3	0	12	60		180	6	Vegetables II, cooked					**VEG. II.** cooked Carrot, squash, turnip, onion, beet.
2	0	8	40		120	4	Vegetables II, raw ...					**VEG. II.** raw Onion, turnip.
0	0	6	25		180	6	Fruit I					**FRUIT I** Grapefruit, lemon, strawberry, tomato.
0	0	12	50		180	6	Fruit II					**FRUIT II** Orange, peach, watermelon, muskmelon, pineapple, sour apple, blackberry, cranberry.
3	1	12	75		90	3	Oatmeal porridge					**OATMEAL PORRIDGE** Made plus four water.
3	0	18	90		90	3	Potato					**WHEAT PORRIDGE** Cream of wheat, farina, etc., made plus four water.
3	0	18	90		90	3	Rice, boiled					**COTTAGE CHEESE** From skimmed milk without addition of cream or butter.
3	0	18	90		90	1	Bread					**FISH, LEAN** Haddock, flounder, cod, bass, trout, pike.
4	1	20	100		120	4	Maccaroni, boiled					**MEAT, LEAN** Mutton, beef, lamb, with obvious fat removed. Also poultry.
4	0	20	100		120	4	Wheat porridge					**CREAM** 20 percent. fat.
1	0.5	5	30		One		Cracker					**NUTS** Butternut, pecan, pignolia, walnut, brazilnut, filbert, hickorynut, almond.
12	1	2	60		60	2	Cottage cheese					**COCOA SHELLS, COFFEE, TEA** Clear infusions.
12	12	0	150		Two		Eggs					**EXTRA ARTICLES** In portions of one ounce, 30 grams.
24	0.5	0	100		120	4	Fish, lean, cooked					
24	15	0	225		90	3	Meat, lean, cooked					
12	16	0	200		45	1.5	Cheese					
8	8	12	160		240	8	Milk					
6	1	4	50		Six		Oysters					
0	12	0	110		15	0.5	Butter					
0	15	0	135		15	0.5	Olive Oil					
5	15	0	150		30	1	Bacon, fried					
1	6	1	60		30	1	Cream					
0.5	4	1	40		30	1	Olives					
4	9	1	100		15	0.5	Nuts					
0	0	0	0		q	s	Cocoa shells, coffee, tea					
0	0	0	0		180	6	Broth					
0	0	0	100		30	1	Whisky					

In using the diabetic dietary the quantities in grams or ounces of each article or group prescribed in the daily ration is written in the space opposite the name of the article, or against the group or part of the group inclosed in a bracket. The computation of the food value of the daily prescription is made by multiplying the number of ounces of each article or group by the proper figures and adding up. The articles and quantities in the daily ration can be distributed in the different meals by the prescriber, or that can be left to the patient to do. This diabetic dietary is somewhat simpler and more flexible than the universal diabetic diet list, but it is inferior to the latter in facility of use, and I have come to prefer the latter in my own work.

DIABETIC DIETS: COMPOSITE DIETETIC PRESCRIPTION*

Diet	1	2	3	4	5	6	7	8	9	10	11	12	13	A	B	C
Prot	11	18	25	34	35	43	50	52	66	68	74	90	103	57	31	13
Fat	6	12	24	31	44	57	72	78	86	99	99	100	121	5	2	0
Carb	10	12	30	42	51	61	70	80	90	100	136	156	168	152	76	26
Cal	135	230	435	585	740	920	1115	1 230	1400	1570	1740	1885	2170	880	450	155

Diet.................... For.. Date.....................

Diet.................... For.................................... Date.................... P......F......C......Cal......

BREAKFAST

CBA 1 Coffee, tea, cocoa shells
1 Egg, one
CBA 3 Fruit I, 180 (6)
3 Cream, 30 (1)
BA 4 Oatmeal porridge, 90 (3)
4 Egg, one
7 Bacon fried, 30 (1)
13 Milk, 240 (8)

DINNER

CBA 1 Cocoa shells, tea, coffee
CBA 1 Vegetables I cooked, 180 (6)
CBA 1 Vegetables I raw, 120 (4)
2 Cream, 30 (1)
BA 2 Cottage cheese, 30 (1)
BA 5 Bread, 15 (½)
5 Butter, 15 (½)
BA 6 Bread, 15 (½)
6 Butter, 15 (½)
BA 6 Cottage cheese, 30 (1)
8 Cream, 30 (1)
A 9 Crackers, two
9 Meat lean cooked, 45 (1½)
A 11 Potato, 90 (3)
A 12 Macaroni boiled, 120 (4)
13 Olives, 30 (1)

SUPPER

CBA 1 Tea, cocoa shells, coffee
CBA 3 Vegetables I cooked, 186 (6)
CBA 3 Vegetables I raw, 120 (4)
3 Cream, 30 (1)
BA 7 Bread, 15 (½)
BA 8 Bread, 15 (½)
10 Butter, 15 (½)
A 10 Crackers, two
A 11 Rice, boiled, 90 (3)
A 12 Fish lean cooked, 60 (2)
13 Nuts, 15 (½)

SPECIAL ORDERS

EXPLANATORY

The quantities are given in grams and ounces, the figures for the latter being in parenthesis.

Cocoa shells, coffee, tea. Clear infusions.

Vegetables I cooked. Spinach, string beans, celery, asparagus, marrow, okra, pumpkin, dandelion tops, beet tops, tomato, leeks, cabbage, cauliflower, wax beans, sea kale, sauerkraut, brussels sprouts, chard, kohl rabi, egg plant.

Vegetables I raw. Lettuce, endive, cabbage, celery, tomato, cucumber, radish, watercress.

Vegetables II cooked. Carrot, squash, turnip, onion, beet.

Vegetables II raw. Onion, turnip.

Fruit I. Grapefruit, strawberry, tomato, lemon.

Fruit II. Orange, peach, watermelon, muskmelon, pineapple, sour apple, blackberry, cranberry.

Oatmeal porridge. Made plus four water.

Wheat porridge. Cream of wheat, farina, etc., made plus four water.

Cottage cheese. Made from skimmed milk without addition of cream or butter.

Fish lean. Haddock, cod, flounder, bass, trout, pike.

Meat lean. Mutton, beef, lamb, chicken with obvious fat removed.

Cream. Twenty per cent. fat.

Nuts. Butternut, walnut, hickorynut, pecan, filbert, almond, pignolia.

Directions for using the Composite Dietetic Prescription.

To get a particular numbered diet from the Composite Prescription, take all the articles before whose names are placed the number of the desired diet and numbers lower than that; or omit all articles before whose names are placed numbers higher than that of the desired diet.

To get a particular lettered diet, take all the articles before whose names are placed the letter of the desired diet; or omit all articles before whose names the letter of the desired diet is not found.

Omitted articles may be scratched if the Composite Prescription is used as an original prescription.

Vegetables II and Fruit II may be substituted for Veg. I and Fruit I in half the quantities. Substitutions and additions may be made of Approximate Equivalents and of other articles by special order.

APPROXIMATE EQUIVALENTS

A. P.0-2, F.0-1, C.9-10, Cal. 45-60.
Bread, 15 (½)
Potato, 45 (1½)
Rice, boiled, 45 (1½)
Macaroni, boiled, 60 (2)
Crackers, two.
Fruit I, 180 (6).
plus Vegetables I, raw, 120 (4)

B. P.0-3. F.0-1, C.12, Cal. 50-75.
Oatmeal porridge, 90 (3)
Vegetables II, 180 (6)
Fruits II, 180 (6)
Vegetables I, 360 (12)
Fruit I, 360 (12)
Green peas, parsnips, apples, pears, cherries, huckleberries, 90 (3)
Green corn, shell beans, bananas, plums, prunes, 60 (2)

C. P.3-4, F.0-1, C.18-20, Cal. 90-100.
Bread, 30 (1)
Oatmeal porridge, 135 (4½)
Rice, boiled, 90 (3).
Potato, 90 (3)
Wheat porridge, 120 (4)
Macaroni, boiled, 120 (4)
Crackers, four

D. P.0-5, F.12-15, C.0-2, Cal. 110-160.
Cream, 60 (2)
Butter, 15 (½)
Olive oil, 15 (½)
Bacon, fried, 30 (1)
Nuts, 15 (½), plus cream, 30 (1)

E. P.12, F.0-1, C.0-1, Cal. 50-60.
Cottage cheese, 60 (2).
Fish. lean cooked, 60 (2)

F. P.12-13, F.7, C.0-1, Cal. 110.
Meat, lean cooked, 45 (1½)
Fish, lean cooked, 60 (2) plus butter, 7 (¼).
Cottage cheese, 60 (2), plus cream, 30 (1)

G. P.12-14, F.12-14, C.0-2, Cal. 150-170.
Eggs, two
Cottage cheese, 60 (2), plus butter, 15 (½)
Meat lean cooked, 45 (1½) plus butter, 7 (¼)
Fish, lean cooked, 60 (2), plus butter, 15 (½)

H. P.8-10, F.7-9, C.12-14, Cal.150-185.
Milk, 240 (8)
Cottage cheese, 30 (1), plus cream, 30 (1), plus Fruit II, 180 (6)
Egg one, plus oatmeal porridge, 90 (3)
Oysters, six, plus bacon fried, 15 (½) plus crackers, two.

The quantities are given in grams and ounces, the figures for the latter being in parenthesis.

*Reprinted from *Diabetic Diets, with a Universal Diet List, E. E. Cornwall, M. D. Connell Press, Brooklyn, N. Y.*

The universal diabetic diet list presents a selection of articles of food for use in diabetic diets, given in arbitrary portions, the quantities of which are stated in grams and ounces before the names of the articles, together with their approximate protein, fat and carbohydrate content and fuel value. Group names are used to a considerable extent in describing the articles of food, the significance of which is given in accompanying text. The use of arbitrary portions of varying amounts instead of uniform quantities, as in the diabetic dietary, has the advantage of making for uniformity in the portions of the same things served at different times.

In prescribing one or more portions, or a fraction of a portion, the proper numeral is written in the blank space which lies opposite the name of the particular article and in the column under the letter designating the meal at which it is taken (B for breakfast, D for dinner, and SL for supper or lunch, etc.). The total number in each case is then summed up in the column of total number of portions. Or the total number of portions of each article prescribed in the daily ration is first stated in the column for total number of portions and then distributed among the different meals. The latter method is usually found most convenient.

The carbohydrate ration is first provided for, chiefly from the carbohydrate group of food stuffs, which is the first group in the list. The articles in this group contain small or negligible amounts of protein and fat.

Next, the protein ration is provided for, chiefly from the protein group of food stuffs, which is the second group in the list. The articles in this group contain little or no carbohydrate and varying amounts of fat.

Next, the completion of the fat ration is provided for, chiefly from the fat group of food stuffs, which is the third group in the list. The articles in this group contain little or no carbohydrate and varying amounts of fat.

Beverages and stimulants are also provided for.

To get the food value of a daily diet thus made out, the totals of the number of portions of each article of food prescribed, as found in the column of total number of portions, are multiplied by the food values of one portion as found before the name of each article. The numbers so obtained are written on a separate piece of paper, and the columns of figures representing the protein, fat and carbohydrate content and caloric value of the different articles in the prescription, are summed up. These sums give the food values of the prescription. If, in this summation, any of the food values of the diet as made out fall short of the food values desired, it is easy to make such additions as may be necessary; in fact, in making out a diet, it is good practice to make a first tentative diet which will fall somewhat short of the desired food values, and to add to it what may be found necessary after the food value of the tentative diet has been estimated.

The variety of food stuffs permitted in the universal diabetic diet list is sufficient for the essential needs in a large proportion of cases, but greater variety may be desirable, and can be secured by the use of substitutions. These substitutions are indicated in the blank space at the foot of the list. The substitution may be of single articles or of groups of articles in the list of *approximate equivalents* (2), or of that list in general, or of articles outside that list. Groups are indicated by their designating letter.

The diet thus made out, while perfectly intelligible, is conveniently copied in conventional menu form for the patient: running the eye down the columns marked for breakfast, dinner and supper or lunch, the articles for those meals are brought together in menu form, but with quantities translated from the portions of the list to grams or ounces. Special orders for substitutions are written in connection with the articles to be substituted for or at the bottom of the page.

THE USE OF PARTICULAR DIETS AS A BASIS IN PRESCRIBING.

Although no rigid plan of treatment is applicable in diabetes, it is often found convenient to use a series of definite diets as a basis for individual treatment. A series is here presented of sixteen definite diets, any one of which can be taken as a point of departure for modification to meet individual needs. They are all balanced, so far as the quantities permit, and all contain fat rations well within the limits of safety indicated by the generally accepted antiketogenic glucose fatty acid ratios. These diets are arranged in two series, of which one, the numbered series, can be used for ascertaining the tolerances, and the other, the lettered series, for gradual starvation to reduce the glycosuria and hyperglycemia, in accordance with the general plan advocated by Joslin. The diets are purposely made very simple in structure. The articles of food used in them are limited to a comparatively small number, greater variety being allowed by the use of the approximate equivalents and of other specified equivalents. Uniformity in the size of the portions generally obtains, and the portions conform generally to those of the universal diabetic diet list. Group names are used which conform to those of that list, for whose understanding the explanations given in that list are necessary. The sixteen diets are all presented in one composite dietetic prescription (2).

Directions for prescribing particular diets of the series through the composite dietetic prescription, accompany the latter. Independent variations starting from any one of the series are easily made. Using the composite prescription, they may be made by adding new articles in the space below the prescription, under the head of special orders. As for example: If Diet No. 9 has been prescribed satisfactorily, but for some reason the prescriber does not wish to give No. 10, but some other modification of No. 9, he can write at the bottom of the prescription, the direction to add to specified meals, the articles of food and the quantities necessary to make the desired modification. It often happens that the carbohydrate, fat or protein ration of a stated prescription, has been increased as much as seems advisable in the case, while it is desired to increase further the rations of one or both of the other two food principles. Instead of making additions by special order, as above described, the same object may be accomplished by scratching some of the articles belonging to a set diet of higher number than that of the one of which the special modification is to be made, and leaving unscratched other articles belonging to the higher numbered diet, whose addition makes the desired modification. The composite dietetic prescription and universal diabetic diet list are conveniently used printed on separate sheets.

Considerable latitude for variety is allowed by the list of articles mentioned in the explanation of the group names used, and more provision for variety is found in the list of approximate equivalents. In the use of the latter (by special order at the bottom of the prescription), any particular group of approximate equivalents may be allowed in place of a particular article in the diet, as for example: approximate equivalents A may be allowed in place of one-half ounce of bread; or a specified number of groups of approximate equivalents may be allowed wherever they fit in, as for example: Approximate equivalents A, B and C may be allowed as indicated; or there may be particular or general allowance of these equivalents with special restrictions, as for example: Approximate equivalents D, E, F and G may be allowed provided there is no increase (or a specified increase), in the rations of meat and bacon, and provided there is no increase (or a specified increase) in the ration of fish. Such examples show how the approximate equivalents may be used. Any single article may be added to any meal by special order.

GENERAL SUGGESTIONS.

In the average case, the first thing to do is to clear the urine of sugar. For this purpose, partial or gradual starvation is preferred. Severe cases which resist a considerable degree of starvation may be given insulin.

After the urine is sugar free, the carbohydrate tolerance should be ascertained by gradually increasing the diet. In this process the protein ration can usually be raised to meet the basal protein requirement very quickly. The basal protein requirement for adults is taken to be two thirds of a gram or one gram of protein per kilogram of body weight, and for children about two grams.

The carbohydrate tolerance is found by gradually increasing the carbohydrate in the diet until sugar again appears in the urine.

The fat ration is usually increased slowly while the carbohydrate tolerance is being determined, and then it is increased sufficiently to supply the basal metabolic requirement. The basal metabolic requirement for the patient at rest is found by multiplying his weight in kilograms by thirty.

After the carbohydrate tolerance is found and the basal metabolic requirement satisfied, that is, after a subsistence diet has been achieved, the fat is increased, and possibly the protein also in some cases, so as to supply enough calories to enable the patient to lead a more active life than is possible on the subsistence diet.

In increasing the fat ration the safeguarding antiketogenic glucose fatty acid ratio must be borne in mind. This ratio fixes a limit to the amount of fat which can be taken with a given amount of carbohydrate without regularly producing acidosis. The figures for this ratio have been variously stated. A widely accepted statement of it has it as one to one and five tenths, counting as glucose all of the carbohydrate, with fifty-eight per cent. of the protein and ten per cent. of the fat, and counting as fatty acid ninety per cent. of the fat and forty-six per cent. of the protein. Another statement of it which is favored by good authorities has it as one to three, counting as glucose all of the carbohydrate with sixty per cent. of the protein, and as fatty acid all of the fat. The limits set by these ratios are not always found to insure against acidosis.

In cases which can not take care of the basal metabolic requirement, and also cases which can not take care of a diet sufficient to meet the energy requirements of the mode of life desired, insulin may be given. The pathological examinations which are essential are these: examination of the urine for glucose and ketone bodies, estimation of the blood sugar, and perhaps estimation of the carbon dioxide of the blood plasma.

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The Pancreas and the Interrelation of the Endocrine and Sympathetic System in Regard to Diabetes

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As pointed out by no less an authority than Joslin (1), insulin does not cure diabetes and the matter of diabetes treatment is still an open one. Important as the discovery of insulin appears to be, I do not believe that it materially changes the question of the rôle of the pancreas in diabetes. In fact, except for a stronger determination in the present researches, I do not see any fundamentally new fact arising from the Canadian experiments. The production of an alcoholic pancreatic extract from the normal pancreas as is done now by Banting and his coworkers, brings the problem at exactly the same stage at which it was brought by much earlier experimenters, i. e., fifteen to twenty years previously. The results obtained by the discoverers of insulin are practically the same as the results obtained by Minkowski (2), Lanceraux, and Hedon (3) since 1898 with the subcutaneous transplantation of the pancreas. The same results have been obtained in 1908 by Zuelzer, Dohm and Marxer (4) with pancreas extracts, *videlicet*, a diminution in the elimination of sugar and acetone bodies and an improvement in the general conditions. But then as now the results lasted only as long as the administration of the extract was continued and no active increase of the animal's own metabolizing capacity was determined by the treatment.

So that the same objections apply to the present experiments as to the earlier ones, which were conducted under the guide of the same biological principles (5).

No one will question, by this time, the important part played by the pancreas in sugar metabolism. But this knowledge must be coordinated with all the other factors of this complicated problem.

In other words, the latest discoveries about the pancreas do not destroy all that has been done before, beginning with the works of Claude Bernard on the storing of glycogen by the liver and on the glycosuria resulting from the *piqure* and proceeding with all the experiments with the adrenals, with the thyroid, with the pituitary body, with the sympathetic system, with the kidneys, with the muscles and other tissues.

Let us consider the problem from the point of view of the interrelation of the different elements composing the sympathetic endocrine system. Let us admit, as many facts prove, and as Massaglia, Vassale, Dominicis, Viola, Pende and so many other authors believe, that this entire system works as a unit. Let us assume that the pancreas is the organ most directly concerned in sugar metabolism, as it provides the amboceptors necessary for the assimilation of sugar by the cells. We knew before, and we know still better now, after the works on insulin, that sugar must be present in the blood in a definite amount in order that normal animal life be preserved. Hyperglycemia is harmful: hypoglycemia is dangerous. The pancreas then must provide its hormone to the blood in a regular manner. This presupposes a delicate mechanism of control upon the islands of Langerhans.

What organ or what organs furnish this delicate control of the pancreas? It is not easy to answer this question *a priori*. But what we know about the interrelation of the endocrine sympathetic chain, brings us nearer to the solution. Of course the pancreas represents a midway station in the metabolic route of glucose. The ultimate processes are the utilization of the sugar by the muscles, the storing up of the surplus, the burning up of the needed quantity in the process of oxidation. It is during all the intermediate stages of the metabolic process, before and after the midway stage represented by the pancreas, that the other members of the sympathetic endocrine system play their rôle, all directed of course by the central nervous system. The ultimate phase is played by the tissue cells. Here, as admitted at present, takes place that combustion, that oxidation, that Lavoisier considered as taking place in the lungs (6).

Now what we know about the influence of the thyroid and of the pituitary on sugar metabolism points to these two bodies as the immediate regulators of the pancreatic hormone supply to the blood. The recent work on the thyroid is important in this respect. By thyroidectomy on partially depancreatized dogs or by ligature of the thyroid arteries, glycosuria disappears, thus confirming the previous notion that the thyroid has an important influence on sugar metabolism.

The fact that a serum antagonistic to the pituitary, as proved by my experiments, has made glycosuria and polyuria disappear in a certain number of diabetic patients, proves the same thing in regard to the pituitary. Then it seems rational to formulate this hypothesis: The pancreas furnishes a hormone which acts as an amboceptor and renders sugar fit for cellular assimilation and oxidation: an excess of this hormone in the blood would be very dangerous, as proved by hypoglycemia shock; but such excess is prevented by the presence in the blood of antagonistic or compensatory hormones provided by the thyroid and the posterior part of the pituitary. For several reasons I am inclined to believe that the thyroid control of sugar metabolism is predominant in infancy, and the pituitary in adult life. As we can not ignore the facts concerning the thyroid, the pituitary and other glands on sugar metabolism, we have but two hypotheses. Either we admit that the pancreatic, thyroid, pituitary, adrenal glycosurias are all independent entities, and we have as many independent forms of diabetes; or diabetes is a special disease due to a dysfunction of the pancreas, and all the other endocrine members are either compensatory or regulatory organs. From the point of view of physiology we have no other solution. On the other side, with the aid of this hypothesis we are able to understand well proved experimental facts, which seemed in conflict with the pancreatic theory of diabetes. For instance: the experiments of Cushing, Goetsch and Jacobson proving that in normal animal the injection of an excess of pituitary extract causes glycosuria could not be reconciled with the pancreatic theory except by admitting that such an excess of pituitary extract neutralizes the pancreatic hormone in the blood, and thereby causes glycosuria.

In the light of this hypothesis all forms of glycosuria are related, so that we may formulate this general theory: With a degenerated pancreas and normal pituitary thyroid function we have diabetes. With a normal pancreas and hyperfunction of pituitary thyroid system, we also have diabetes. In both cases we have a decreased amount of pancreatic hormone in the blood.

Pathological findings offer us another explanation of diabetic pathogenesis, but not a practical solution in regard to therapy. Even admitting that spontaneous diabetes is constantly due to a degeneration of the islands of Langerhans, we still are compelled to revert to physiology in order to arrive at a successful treatment, at least until we find a way—which is out of sight for the present—of curing or preventing the degeneration of the islands of Langerhans.

We must revert to physiology because in order to treat diabetes we must rely on the remaining healthy part of the pancreas for the restoration of the patient's health. And we must either substitute the destroyed part of the organ, or stimulate, if possible, the remaining healthy portion of it. The transplantation of pancreas and the administration of pancreatic extracts, including insulin, represents tentatively the first solution. Unluckily the effects of these measures are only temporary. The counteracting of the thyroid and especially of the pituitary hyperfunction offers a second solution. As far as practical results are concerned, the observed facts prove: 1. That antipituitary serum in a considerable percentage of cases acts as an active stimulant to that function or functions of the body upon which sugar metabolism depends. In every case in which the ability of the patient's system to metabolize sugar is decreased but not entirely destroyed, the logical course appears to be the stimulation of the remaining metabolizing capacity. 2. In all those cases of diabetes in which the metabolizing capacity for sugar is completely destroyed, there is no logical hope at present of restoring it. In these cases, as admitted by all investigators, insulin can not cure diabetes, but is nevertheless a valuable means of helping this class of patients along.

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332 WEST EIGHTY-SEVENTH STREET.

The Role of the Spleen in Certain Anemic Conditions*

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The history of our knowledge of the nature and functions of the spleen shows certain unique features, in that variations in the size of the spleen have long been classed among the essential findings on clinical examination, assuming the importance of cardinal points, in diseases such as malaria, leucemia and typhoid fever and yet our actual knowledge of the physiology of this organ is still obscure. One might consider this tardy development in knowledge remarkable in view of the fact that the spleen is a perfectly definite, circumscribed organ, occupying a relatively prominent location among the abdominal viscera and easily accessible to experimental study. There are, however, suggestive reasons for the slow development of our knowledge of the spleen which will be referred to later.

The spleen is a solid organ surrounded by a fibrous capsule which sends trabeculæ into the substance of the gland. The trabeculæ break up into finer and finer branches producing a spongy matrix the interstices of which are filled up by spleen pulp. The organ is exceedingly vascular and is supplied by the largest branch of the celiac axis. As we follow the branching of the smallest arterioles into capillaries we find the intimal cells finally ceasing to form channels and existing as rather large, irregularly placed cells. These modified endothelial cells, with a few supporting cells, make up the bulk of the spleen pulp.

These cells are phagocytic, sometimes remaining stationary in their reticulum and sometimes wandering about; but in either case engulfing various particles, especially weakened red cells. At certain times these cells proliferate and some of this type of cell is always being carried away in the venous blood entering the portal vein to arrive at the liver. The Malpighian bodies are pure collections of lymphoid cells scattered through the spleen, enveloping small arteries and thus obtaining a richer oxygen supply than the rest of the spleen pulp which is bathed in venous blood. The Malpighian bodies produce lymphocytes which break off from time to time and make their way into the spleen pulp also, through which, of course, the blood stream from the splenic artery is constantly filtering.

We must conclude that the spleen in the adult normally destroys red cells through the process of phagocytosis. The question as to whether the spleen produces a ferment with which to hemolyze red cells is not yet finally answered but since destruction takes place within the cells it is unnecessary to postulate a special hemolyzing secretion in the spleen itself. These same phagocytes engulf also bacteria, malarial organisms, etc. Iron or at least altered hemoglobin is prepared for the use of the liver cells. It would seem as if the spleen secreted a substance which activated and stimulated the bone marrow to produce red cells and it is possible that this control over the bone marrow may in some cases be a restraint as of leucocyte production in certain conditions like typhoid fever and malaria which are characterized by leucopenia. This might account for the beneficial action of x rays and radium in leucemia, supposing the stimulation of the splenic cells to check leucocyte production in the bone marrow. It is possible though that the mechanism of this relation between the spleen and the bone marrow, at least as far as the red cells are concerned, may be through the supply and storage of iron rather than through some specific manufactured substance like a hormone.

In the Bradshaw lecture for 1920, Sir Berkeley Moynihan draws attention to the fact that the spleen is not a specialized organ with one or two particularly developed functions but is one of a group of organs more or less interdependent. Failure to recognize this is, perhaps, the chief reason why the splenic functions have for so long remained obscure. Moynihan's conception of the problem is most illuminating in that he considers the spleen to be closely connected with, and in fact a part of, four important systems of the body.

1. The spleen as a part of the hemopoietic or bloodmaking system. Formation of red and white cells takes place in the spleen only during embryonic and early postnatal life as a rule. In infections and leucemia, however, the spleen may take part in the production of white blood cells. The relation of the spleen to the bone marrow has already been discussed.

2. The spleen as a part of the reticuloendothelial system. We have already described the endothelial cells as lying loosely in the reticulum of the spleen pulp. The liver also has certain large phagocytic cells, the star cells of Kupffer which are endothelial in nature. They are known to proliferate after removal of the spleen and they may take up iron pigments. Lymphatic glands also contain phagocytic endothelial cells which multiply after splenectomy. The bone marrow also contains somewhat similar cells. Thus these structures seem definitely related morphologically and we can more easily understand why blood pigment is found in the liver, lymph glands and bone marrow when hymolyzing poisons are administered. It has been found in studying the immune bodies of cholera that the spleen and long bone marrow contain the largest proportion of these substances. Various other experiments on animals indicate that the spleen is an important power in resisting infective processes.

3. The spleen as a member of the digestive system. All the blood of the spleen passes into the liver, carrying hemoglobin within the bodies of the wandering cells. The spleen, therefore, stands in an important relation to the liver. It is known, of course, that synchronous with digestion there is a slow expansion of the spleen, but what bearing this change may have upon the socalled digestive leucocytosis is not clear. It is stated that splenic extracts cause intestinal peristalsis. A further connection with the digestive sys-

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tem lies in the probability that the spleen takes part in purin metabolism.

4. The spleen as a part of the sympathicoendocrine system. The sympathetic nervous system provides a close network about the splenic artery and its branches and this in turn connects with the solar plexus and so with the adrenal glands. The vagus innervates the muscle fibres in the connective tissue. There is some experimental work also on the possible relationship between the spleen and the thyroid and the thymus glands but it is not conclusive.

Clinically the examination of the spleen concerns itself chiefly with changes in the size, shape and consistency. It is estimated that the spleen must be twice its normal size to be palpable. Enlargement of the spleen or splenomegaly occurs in a variety of conditions, grouped conveniently as follows: 1. Acute and chronic infections and venous stasis. 2. Leucemias. 3. Hodgkin's disease. 4. Splenic anemia or Banti's disease. 5. Gaucher's disease. 6. The socalled pseudoleucemias of infants or von Jaksch's disease. 7. Hemolytic states with jaundice.

It is proposed to discuss in this paper particularly certain anemic conditions in which splenic enlargement is a prominent feature—namely socalled splenic anemia, and, secondly, hemolytic icterus. A typical case of splenic anemia is illustrated briefly by this account.

CASE I.—No. 5220. A clerk, aged thirty-four, was seen in December, 1918. He stated that the preceding February he had had several attacks of severe vomiting of blood during which he nearly died. About a month before consultation, a similar attack occurred. Since that time he had had pain in the epigastrium usually after food but sometimes when the stomach was empty and then the pain was relieved by food for a time. He had had slight nausea and a little constipation. He had not noticed any blood in the stools. He recalled no previous severe diseases, had never taken alcohol to excess and none for two years, and had not smoked for three years. His father and mother died of cancer, one of the mouth, the other of the stomach.

Physical examination showed a slight undernutrition (ten to twelve pounds); pale mucous membranes; several suspected teeth, and a moderately enlarged spleen. Blood examination: Red blood cells, 3,744,000; hemoglobin, 42 per cent.; white blood cells, 2,400. The differential count showed 45 per cent. of large mononuclear cells. The test meal showed some obviously old blood. Dental examination showed extensive areas of rarefaction about nine teeth and two others were quite loose from pyorrhea. Further examinations indicated probable adhesions in the right upper quadrant of the abdomen but no further important diagnostic points were revealed.

It was considered that the patient was suffering from splenic anemia and it was determined to raise the level of the blood by transfusions and follow this by exploratory laparatomy with removal of the spleen if justified at operation. The infected teeth were to be extracted as soon as possible and the general physical condition of the patient brought up to its highest level.

This plan was followed out and the patient left the hospital after splenectomy in excellent condition with blood much improved though not quite up to normal. Letters several months later showed him well and able to attend to his work. Ten months later he reported gastric bleeding again but was able to go to work very shortly.

The essential features of this disease include a large, firm spleen, a marked secondary anemia, and a tendency to hemorrhage especially from the stomach. If the condition is allowed to persist for some time, changes of a cirrhotic nature occur in the liver, ascites develops and the patient finally dies.

The anemia is of the secondary type and of varying severity according to the grade and progress of the disease. There are spontaneous remissions also with periods of approximately normal blood. The color index is less than one. The red cells show moderate variations in size and the while cells are reduced in number. There is usually a relative lymphocytosis. There is some response to rest, food and blood tonics in general but it is by no means satisfactory. A large hemorrhage may, of course, make a sudden decided reduction in blood values.

Hemorrhages are sometimes very large when coming from the stomach. Less severe bleeding may take place as epistaxis or as hematuria or may occur into the skin, producing purpuric spots or areas. In advanced cases where cirrhotic changes in the liver are present the gastric hemorrhage may come from esophageal varices, but in the earlier stages it is more likely that there is rupture of the dilated vasa brevia into the stomach. Stasis or obstruction on the part of the spleen is certainly not the only element in the causation of hemorrhage since quite copious bleeding may take place after splenectomy though it is not common. Such bleeding is noted to have occurred in the case mentioned above. Gastric hemorrhages are often difficult to explain satisfactorily and it is sometimes said that they are of toxic origin especially in connection with lesions in the gallbladder, appendix, liver, and other organs. In any laparotomy which has splenectomy in view it is important that careful exploration should be made of the other abdominal organs. It is difficult to see the mechanism of this the ory of toxic origin unless we postulate erosion of the gastric mucosa. I have, however, in mind a case, showing a marked secondary anemia with melena, which was strongly suggestive of gastric cancer but which on exploratory laparotomy showed a normal stomach and the presence of gallstones.

The spleen in splenic anemia shows marked fibrosis, including thickening of the capsule and trabeculæ and changes of a fibrotic nature in the reticulum. Endophlebitis is also sometimes to be found. The spleen pulp itself is greatly increased in amount chiefly due to increased numbers of venules. Warthin believes that in many, if not in all, cases of splenic anemia the underlying condition is obstruction in the splenic and portal circulation most commonly due to thrombophlebitis. The action of the spleen normally may be likened to that of a filter, removing not only old red cells but also bacteria from the circulating blood and we must suppose the ordinary acute splenic tumor to be in part at least in connection with this function. If the splenomegaly is the result of the isolation of malarial organisms or of tubercle bacilli or the spirochetæ of syphilis, or other organisms, then we have a specific disease and we regard the enlargement of the spleen as merely one of the body's protective measures. There must be, however, many similar splenic reactions against various bacteria or toxins. If this be pronounced, of fairly long standing and accompanied by anemia of marked grade, we group the cases as splenic anemia or Benti's disease. This at least is the present status of the matter. This theory practically infers that the anemia is a secondary matter and that the splenic enlargement is the primary thing. We could, of course, refer the anemia to the hemorrhages except for the fact that they are not constant and, in fact, are absent in some cases showing very low red counts. The red cells in splenic anemia do not show an increased fragility. W. J. Mayo leans to the opinion that a fibrotic spleen destroys more red cells and that in the absence of any special stimulation of the bone marrow anemia must result. He suggests, too, that the disease changes may bring about reduction of the pigment production and thus actually reduce the hemoglobin balance.

The extraordinary thing, however, is that removal of the spleen seems to remove the bar to blood production for there is rapid and permanent return to an approximate normal count. No other form of treatment has been found to bring about this result. For this reason alone it is justified but there are added and important advantages in thus not only ridding the patient of the weight and discomfort of the enlarged organ but also in avoiding certain unhappy complications such as traumatism, rupture, and other conditions.

In passing, it may be well to refer to certain cases of splenomegaly with lues in which the patients seem unusually resistant to any antiluetic treatment. Mayo has seen a number of such instances which responded readily after splenectomy, suggesting that the spleens were the hiding places of many spirochete. The case reported below, which was recently under observation, suggests this condition.

Case II.—No. 8111, a man of thirty-four, who complained of general weakness and indigestion. He stated that about one and a half years ago he became jaundiced. An exploratory laparotomy was done but he was told that nothing was found beyond thick and obstructive bile. Biliary drainage by duodenal tube was done on several occasions and gradually the jaundice cleared. At about the time of the operation the blood Wassermann was found to be positive. He then took salvarsan treatment and followed it with mercury. The spinal fluid was said to be negative. About two months ago the blood was found to be still positive.

Full and careful examinations in this case showed emaciation, aortic and mitral insufficiency, a spleen reaching practically to the umbilicus and a marked secondary anemia with low white count: the red cells 2,408,000, the hemoglobin 44 per cent., and the white cells 3,750. There were constantly a few red blood cells found in the urine. The blood Wassermann reaction was strongly positive. There was no history of hematemesis but there had been some blood coming from the nose during the summer. The case probably represented a splenic anemia with lues in addition though it is quite possible that the lues was the primary factor.

In this instance the poor general condition made one advise a preliminary upbuilding with antiluetic treatment but in all probability splenectomy will have to be done before any lasting improvement can be expected.

We may then formulate a theory that splenic anemia is the result of a chronic infection or toxemia bringing about fibrotic changes in the spleen, which in turn acts to destroy increased numbers of red blood cells and may, in addition, be the means of disturbing the hemoglobin balance of the body. Severe hemorrhages are usually the result of engorgement of certain bloodvessels and are usually of mechanical origin though toxic forces sometimes have been invoked to explain certain hemorrhages which in some instances may be from mucous membrane erosions. A continuation of the condition brings about further lesions in the liver of a cirrhotic nature, more nearly corresponding to the description of Banti's disease with its later development of ascites and a general downward course. Splenectomy is the only effectual treatment.

Another type of anemia with splenomegaly and certain peculiar added features is exemplified by the following case:

Case III.—No. 7240 was a boy of nine years who was examined in April, 1921. He is stated to have had influenza about two years ago at which time he was sick for two months. Since then he tired very easily. Five or six weeks previously he was noted to be anemic and his family physician on examining him found an enlarged spleen. The family history was most interesting. The patient's mother died about a year ago of what was said to be influenza. Many years previously Sir William Osler had examined her and found an enlarged spleen. The patient's maternal grandmother accompanied him and was seen to be slightly but definitely jaundiced. She stated that she had gallstones, gave the information about her daughter's spleen and added that Sir William Osler also found an enlarged spleen in her case.

The boy himself was well nourished but showed a definite yellowness of the skin and scleræ. There was a litle general glandular enlargement. The spleen reached about to the level of the umbilicus and was very firm.

On examination of the blood the red cells were found to number 3,472,000; hemoglobin, 60 per cent.; white blood cells, 15,000. The red cells themselves showed marked variation in size, shape and hemoglobin content. Many of the cells showed marked polychromasia and there were many huge cells; four normoblasts and one intermediate were seen in a single smear. Platelets were normal. There was nothing remarkable about the white blood formula. Blood Wassermann reaction was negative. Other examinations of the blood showed a definite increase in the fragility of the red blood cells. There was marked increase in the number of reticulated red blood cells seen on vital staining. Two tests of urine gave markedly positive reaction for urobilin, otherwise the urine was normal. The case was considered to be one of familial splenomegalic anemia with slight jaundice and increased fragility of the red blood cells, in other words, a congenital hemolytic icterus.

The general condition was explained to the family with the advice to treat the anemia by rest, iron, and other treatment, for a time. The bearing of splenectomy on the case was explained but since the boy seemed fairly well it was decided to postpone this for a time at least. Letters six months or so later reported that the boy was in good condition and attending school.

Here we see then marked secondary anemia, splenomegaly and acholuric jaundice, that is, icteric discoloration of the skin but with absence of clay colored stools and dark urine—a syndrome corresponding to hemolytic jaundice. The most important essential for the production of the disease seems to be increased fragility of the red blood cells.

Attention was called to slight, chronic, congenital jaundice with splenomegaly in 1890 by Claude Wilson. Within a few years an acquired type was also differentiated. The case quoted shows a remarkable familial trend since both mother and grandmother had large spleens and the grandmother was noticed to be jaundiced and to have a history of gallstones. This family tendency is a frequently recognized characteristic of the congenital cases. The findings in the acquired type do not differ materially from the congenital form but the acquired types are likely to be much more severe and of more serious outlook. Indeed the congenital form may cause little or no disturbance and the patient may live to a very great age.

These facts are, of course, of the greatest importance in considering the advisability of splenectomy. It is interesting to note that the presence of gallstones is a frequent finding in cases of hemolytic icterus coming to operation.

Confusion is still further introduced by the occurrence of socalled crisis during which there is malaise, fever, sensitiveness of the spleen with increase in its size, deepened jaundice and sometimes an enlarged liver with tenderness in the epigastrium. There is found an acute anemia during these periods and it is supposed that a sudden unusual hemolytic activity is responsible for the whole picture unless in those cases where an actual biliary obstruction is indicated by acholic stools and bile in the urine. These cases of hemolytic icterus show a secondary anemia which, particularly during the crises, exhibits evidence of regeneration including nucleated red cells, etc. The red cells should always be tested with hypotonic salt solution since it has been clearly shown that in this disease there is definitely decreased resistance. In the case of the boy already quoted the hemolytic limit was .55 per cent. sodium chloride while the normal control was .4 per cent. sodium chloride. Vital staining should also be resorted to in order to determine the number of reticulated red cells since this gives an indication of the response of the bone marrow. They are probably youthful red cells hurriedly sent out by the bone-marrow. A large number of such forms show an actively functioning marrow. In aplastic cases they may be nearly absent. This particular case showed thirteen per cent. of reticulated cells as against one per cent. in a normal control.

The jaundice is interesting in several particulars. It is usually not very intense though subject to variations. There is no itching of the skin. The stools contain bile and the urine contains no bile (unless, of course, complicated by actual obstruction of the bile ducts) but does contain urobilin. These facts, of course, merely indicate the mildness of the jaundice for we know that bile pigments are held in the blood up to a certain point which we may call the threshhold. If concentration proceeds beyond that point jaundice appears.

Even if we accept the theory that increased hemolysis leading to greater concentration of bile pigment in the blood results in jaundice and increased urobilin in the urine because of the insufficiency of the hepatic cells, we are still faced by the fact that splenectomy relieves the condition and so we reach the conclusion that the spleen plays perhaps the most important rôle in this condition. The two principal theories of the causation of the disease have been: 1, an increased fragility of the red cells, and, 2, increased hemolysis induced by the spleen. We can not choose between these two since removal of the spleen is usually attended by complete relief including decreased fragility of the red cells but in several recorded cases symptomatic relief was complete but the cell fragility was unchanged. Examination of such spleens after removal shows only a congested pulp with no specific changes.

Splenic anemia and hemolytic jaundice present certain similar manifestations and this is particularly true as regards relief of splenectomy. It is pretty certainly determined that after splenectomy in general the red cells of the body show increased resistance to hypotonic salt solution and to hemolytic poisons. Unless undertaken very late in these two conditions or in the presence of serious complications this proceeding does not present undue hazards. The Mayo Clinic reports give a mortality of 12.3 per cent in seventy-three splenectomies for splenic anemia and a mortality of 3.2 per cent. in thirty-two cases of hemolytic jaundice. One of our own patients returned for examination nine years after splenectomy for splenic anemia with severe hemorrhages. He had led an active life but returned because he had observed two tarry looking stools. All examinations were negative however.

CONCLUSION.

We must think of the spleen in general as a mass of cells having in general the attributes of lymphoid tissue and variously related to other organs in the body. In its absence other lymphoid tissue may act somewhat vicariously for it. Phagocytic cells in the spleen undoubtedly break down red cells and transport the altered hemoglobin to the liver. There is as yet no proof that the spleen produces a true internal secretion. The results of splenectomy in splenic anemia and in hemolytic jaundice show that the spleen plays at least a most important rôle in the pathogenesis of these two conditions.

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The Dark Age in Medicine

*A Projected Retrospect**

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We have chosen for our subject on this occasion a brief discussion of the conditions prevailing in our profession just one hundred years ago—that is, in the 1920 period. This period of the early twentieth century, as you all know, has been aptly termed "The Dark Age in Medicine." Perhaps it would be more appropriate, however, to call it the Dark Age *for* Medicine, or, at least, for medical men, since it was not the ignorance of the physicians at that time that earned the period the sobriquet, but rather the ignorance of the general population about medical matters. That the physicians of that period seem so utterly submerged was not really due to their lack of accomplishment, for their accomplishments were amazing; but rather it was the failure of the majority of persons outside the profession to understand and appreciate what regular medicine had done and was doing—the majority that guided and controlled the destinies of our country at that time.

There was a reason for this, and a very good one, namely, the intelligence of the average American of that time. Far from being the almost superman he had thought himself, the investigations of the great war had led to the astonishing discovery that twenty-five per cent. of all Americans were illiterate, while the average intelligence was that of a fourteen year old child! It was one of the most amazing and shocking discoveries in American history. Yet how could it be otherwise? This great El Dorado of the West with open doors through which Europe had been pouring its scum for a century—what other effect than degenerating pollution could result?

This result showed in the literature, music, art, and amusements of the time. The average American's literature at that period was almost exclusively the ochre tinted newspapers devoted largely to crime, socalled politics, and other forms of scandal; his music was a rhythmic combination of discordant sounds called jazz; his art was the daily pen sketch in the funny sheets, simplified to line drawings to meet the prevailing intelligence level; and his amusements were those requiring speed rather than culture. All this, of course, the natural result of an average fourteen year old intelligence.

But do not imagine that this puerile intelligence level applied to the members of our profession. On the contrary, the wise old physicians of that period had been steadily lifting their membership intelligence level so that no fourteen year old adult could join the select fraternity. Yet, since the country as a whole was governed and judged by this childish standard, one may readily understand why it was that the great science of medicine was so submerged and popularly opposed at that time. It was merely an inability to comprehend—and hence to condemn. Naturally, there could be no other result.

Please bear this fourteen year intelligence level in mind. It will help to explain some of the seeming obliquities of that particular Dark Age.

The fact that the physicians appreciated their position at that time, and that they retained a sense of humor, is shown in the preface to a little book written by a physician of that period. The book is called *How to Practice Medicine*. And in the preface the author says: "This book is for physicians only—everyone else, of course, knows all about this subject." It is probable that some of the better class of laymen appreciated this bit of sarcasm as well as the physicians. Still, the status of the physicians of that time contrasted strikingly with that of physicians in the preceding century. Thus, six honored physicians were among the signers of the Declaration of Independence made during the Revolutionary War. Yet, in the great war of this Dark Age period we find no popular adulation of even one medical man—no popular acclaim of the profession whose victory over war injuries and war diseases was far more decisive than any victory of arms.

This suggests that in the year 1920 there were many persons who practised the healing art other than those belonging to the regular medical profession. There were, indeed; and, moreover, these dealers were permitted to practise their art unmolested by the authorities and even actually encouraged by them. There were, for example, types who cherished the peculiar delusion that there was no such thing as disease or death—or almost anything else. In the year of 1920 this form of superstitious jugglery was extremely popular. The cult had been originated by a charming old gentlewoman of Boston who taught that disease was nonexistent, and from her teachings acquired great fame—also great earthly emolument. After which she died of disease.

This Dark Age was a period of superstition in which muscle and politics were exploited at the expense of brains. At that time government of the politician, by the politician, and for the politician had not yet perished from the land; bricklayers received higher pay than many college presidents; and locomotive engineers frequently received larger pay checks than did the Governor of the State in which they operated their trains.

As for superstition, there appears to have been a striking similarity between the people of America and those of the much despised Chinese Kingdom of that period. For example, the Chinaman whittled images out of wood which he set up as gods to act as mediums for communication with the Divinity. The Chinaman's method was somewhat crude, since he had no means of checking up or recording the messages received. The American's method was better—more exact. He whittled his god out of wood, to be sure, but instead of making the image of a man he shaped it into the form of a small three legged table which he called a ouija board. This wonderful board, when properly manipulated by deft fingers and active imagination, would spell out perfectly definite answers to questions and transmit written messages from almost any kindly disposed and unoccupied spirit living in the world beyond.

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*From an address delivered in the year 2020 A.D. before the International Congress of Physicians at its annual meeting.

The advantage of this type of idol over the Chinese one is obvious. The Chinaman must necessarily guess at the messages he received, while the American would get his message written down in perfectly plain English. And thus it became one of the popular indoor sports of the period to hold long and arduous communications with the shades of the other world. So it followed that instead of spending his evenings in meditation, or in reading the printed earthly messages of the departed great, such as Socrates, or Baron Munchausen, or Mother Eddy, the American simply took to his ouija board and talked to these people direct. It must have been much more gratifying to get in direct communication with any shade one cared to, than to read his earthly platitudes. But one cannot escape the feeling that it may have been a trifle hard on the shades, particularly ,the popular ones, on rainy evenings when everyone was at home and the ouija boards working on full time.

That this had a direct bearing one the practice of medicine, one may readily understand, for when one could receive direct communications from any of the great departed physicians he chose, why waste time and jeopardize one's health by calling in the local physician who was necessarily young and inexperienced by comparison. Better by far to have your attack of indigestion treated directly by Hippocrates, Galen, John Hunter, or Osler, thus obtaining the very best advice for the least possible monetary remuneration. Such things make strong appeal to the fourteen year intellect.

One should remember, of course, that the practice of medicine at this time was a strictly localized affair, and the doctor simply a local agent, so to speak. Merely because a man was a great physician licensed to practice in one State it did not follow that he was accepted as a physician in an adjacent State perhaps only a few blocks away. Thus an eminent physician in Massachusetts was no physician at all in Connecticut, for example,—was a law breaker if he prescribed a dose of castor oil that could legally be dispensed by a local veterinary or midwife. Yet, obviously, if a dose of castor oil prescribed by Dr. Wise in the Bay State was good for infantile colic in Massachusetts, the same prescription written by the same doctor for the same condition in Connecticut should have been equally good. But such was not the case, at least legally speaking, in the year 1920.

One must bear in mind also that in the submerged period of which we are speaking, physicians were only one group in a large and diversified assortment of people who practised the healing art. Indeed, after running over the list of persons other than the regular physicians who were permitted to treat diseases, one is inclined to place the physicians of this Dark Age somewhere in the "also ran" class—a sort of glorified peace officer's assistant, particularly useful to undertakers for signing death certificates.

For example, there was a large and influential body of healers who based their treatment of most human ailments on the theory that the bones of the spinal column are forever slipping slightly out of place thus causing all manner of dire physical catastrophes. And it was the function of this group of socalled physicians to alleviate these ailments by deftly pushing the misplaced vertebræ back into alignment, often with a simultaneous cracking of the knuckles which was tremendously helpful in a psychotherapeutic way.

Now it seems to us today that any intelligent person capable of ordinary reasoning power would have some doubt about this wabbly, slippy condition of the human spinal column. Even at that period persons must have observed the lower animals and have noticed that the spinal columns of such animals were able to withstand all manner of strains and abuses, and that even infants constantly subjected their backbones to the worst kind of maltreatment. And they should have been able to reason that the adult human spinal column did not differ very materially from the corresponding organs of other animals or of the infant, that it was, indeed, the one anatomical organ that really tended to "stay put" as nature originally constructed it. Moreover, it was common knowledge at that time that the real scientists were never able to detect these minute slippings of the spinal vertebræ. But here was where the fourteen year old intelligence came in: these grownup children would believe almost anything that was told them. And so these spine adjusting physicians attained great popularity with the trusting but guileless general public.

Which leads one to draw the mental picture of a community in which the idea of the stability of the spinal column was comparable to that of the chocolate eclair, a popular, squashy sort of dessert of that period. One can picture the apprehensive members of such a community going about with baited breaths, holding themselves in rigid suspense lest some sudden exertion on their part should throw their degenerate vertebræ out of alignment. Or see them rushing off to the spine adjusters to have their vertebræ lined up after the catastrophe had happened. It is difficult for us to believe, at this time, that such things really happened among presumably intelligent people in the dark period of 1920. Yet there is no gainsaying the fact—the records speak for themselves.

It is interesting to note that this form of treating diseases never found much favor among the Dark Age veterinaries or their clients. Perhaps the general attitude toward the subject is tersely enough expressed by a rural legislator of that time when approached on the subject of possible veterinary osteopathy legislation. "No, sir," he said, "we don't allow no fool experiments on our dumb critters—they're too valuable."

But these spine adjusters of this particular school were not permitted to pursue their vertebræ treatments without rivalry. They had hardly reached the pinnacle of popularity when another body of spine adjusters appeared as rivals—socalled doctors who might aptly be termed ultraspine adjusters.

These persons termed themselves chiropractors and focused their energies solely upon the spinal column, whereas their predecessors had now broadened their views sufficiently to admit that certain diseases—such as lues, the hives, or ectopic gestation—were not entirely due to some slight vertebræ displacement. So that presently the chiropractor was manipulating the spine of patients in every State, and was almost everywhere recognized by law as equally competent to care for ailing humanity as the regular physicians who had devoted years of study to scientific subjects.

It is difficult for us at the present time to understand just what chiropractic was; but here is the accepted definition given by D. D. Palmer, the creator of this strange mental obliquity. "Chiropractic," he says, "is a name given to the study and application of a universal philosophy of biology, theology, theosophy, health, disease, death, the science of the cause of disease and art of permitting the restoration of the triune relationship between all attributes necessary to normal composite forms; to harmonious quantities and equalities by placing in juxtaposition the abnormal concrete positions of definite mechanical portions with each other, by hand; thus correcting all subluxations of the spine, atlas to coccyx inclusive, for the purpose of permitting the recreation of all normal cyclic currents, through nerves, that were formerly not permitted to be transmitted, through impingement, but have now assumed their normal size and capacity for conduction as they emanate through intervertebral foramina—the expression of which were formerly excessive or partially lacking named disease. (To replace the full quota of positive with an equivalent negative; permitting the reconveyance of the intelligent immaterially into the mechanical corporeal.)"

From all of which one is able to see at a glance that chiropractic was a very serious as well as a wholly incomprehensible thing, carefully chambered to fit exactly into fourteen year calibred intellects. However, it has been suggested that through some printer's error the above definition is misquoted—is, indeed, an old English court form of conveying the power of attorney or some other similar legal complexity. But such is not the case. It is "Doctor" Palmer's own definition; and it is to be hoped, even though doubted, that he, at least, thought he knew what he thought he was trying to convey, or failing to convey, in his verbal meanderings.

Now, should anyone at the present time doubt that these chiropractics were taken seriously at that period, witness the following passage quoted verbatim from a newspaper printed in the year 1921 describing the treatment of a certain fair chiropractic operator who seems to have done something not subscribed to in the code. In large type we read as follows:

> "PARADE TO TAKE GIRL DOCTOR TO JAIL.
>
> Alice Huhn, Twenty-One, Chiropractic, to Serve Term for Practising Without License.
>
> "A parade of more than sixty automobiles will escort a girl to jail at Santa Ana tonight.
>
> "The girl is Alice Huhn, twenty-one, Orange County chiropractic doctor, who will begin serving a sentence of sixty days in the Orange County Jail for practising without a license.
>
> "In the same cell where Bebe Daniels, film star, was incarcerated for ten days, victim of a court sentence for speeding on an Orange County highway, Miss Huhn will remain for sixty days.
>
> "Chiropractors from all sections of Southern California will assemble in automobiles tonight in Anaheim, where an 'honor parade' for Miss Huhn. The parade will begin at 7:30 o'clock at the office of Dr. Huhn in Anaheim, and will proceed through that city and Santa Ana to the jail, decorated with banners and traveling to the strains of a brass band.
>
> "Anaheim friends of the girl and other members of the chiropractic profession are planning to bedeck the cell in the same grandeur and luxury as when Bebe Daniels was an inmate. They will keep her cell fresh with flowers during the period of the sentence.
>
> "Doctor Alice Huhn was born in Anaheim and has lived in that city ever since. She is a Sunday School teacher in one of the Anaheim churches."

Apparently there was a premium on crime in those days. And, considering this ovation paid to a lawbreaker because of her lawbreaking, one is forced to the conclusion that there certainly was considerable incentive for becoming one of these socalled chiropractic thrusters. I do not find any record of a regular physician lawbreaker of that time being paraded to flower lined cells because of his lawbreaking, although of course criminal worship was then quite a popular form of devotion. Still, one must not judge too harshly. There are limitations to the reasoning powers of a fourteen year intelligent level.

And one must always bear in mind also the standards by which popular heroes were measured at that time. It was the age when emotion rather than calm intellect seemed to dominate. And we know the truth of the assertion of Dr. Dana, a very great physician of that time, to the effect that "when emotion dominates, civilization halts or disappears." And as an example of what emotion may do in the field of hero worship one has but to recall a notorious criminal case of that period in which the discarded husband of an alleged murderess became "the man in a million," and was featured by the movies, and invited to speak from pupits. From our present point of view this seems a queer bid for fame—a thing to entitle one to be termed "one man in a million." But possibly this was a subtle bit of irony: being exceptionally unlike the usual run of mortals does not necessarily imply superiority.

The law, which has always been notoriously hidebound, seems to have lived up to its traditions during the Dark Age period. The one redeeming quality of the lawmakers seems to have been a subtle and abiding sense of humor which radiated all through their grim work. Thus, one finds the perennial pleasantry obtruding itself everywhere to the effect that, "a man is considered innocent until proved guilty beyond a reasonable doubt." Apparently this was a standard legal joke at the time.

But meanwhile, any person suspected of a crime was, first of all, locked in jail, on the assumption, we suppose, that being still innocent he might otherwise become contaminated if allowed his freedom. But, lest the monotony of confinement prove irksome to so innocent a person, things were sometimes enlivened by certain third degree proceedings which abounded in humor—at least from the legal point of view. Of course any such inquisition methods worked upon a freeborn and innocent American citizen was entirely illegal. And, let it be said to the credit of the legal fraternity of that Dark Age, that persons guilty of perpetrating these inquisitional methods were sometimes admonished, or even warned by the courts.

But these little humorous touches in the legal proceedings before the actual trial were entirely offset by the sinister pageant of the trial itself. This trial was presided over by a judge, part of whose duty was to prevent lawlessness among the lawyers; and a bailiff, who exercised the same restraint over the audience. There were also twelve or thirteen jurors who were chosen largely for their lack of knowledge or opinion. If they had an opinion they couldn't be jurors. Thirteen was considered an unlucky number at that time.

The trial itself was divided into three parts. In the first part certain witnesses who were sworn to tell "the truth, the whole truth, and nothing but the truth," were allowed to tell such portions of the truth about the accused person's guilt or innocence as the opposing lawyers and the legal technicalities permitted. You see, the whole truth part was a little legal pleasantry, also. Meanwhile, in some of the older States, such as Massachusetts, the prisoner sat in the court room in an iron cage built like a miniature prison. At the present time we are quite unable to understand the object of this cage unless it was for the twofold purpose of emphasizing the legal pleasantry about the presumption of innocence. In our own time it has been suggested that this human bird cage did not enhance this presumption.

The second, and more pleasant stage of the trial, followed immediately after the testimony by the witnesses. The object of this stage of the trial was to give the attorneys a chance to show their skill as orators. Theoretically, you understand, the jury was supposed to decide upon the man's guilt or innocence by evidence presented. But in this second phase of the trial it was the function of the attorneys on each side to make the jury discredit anything said on the witness stand for or against the prisoner according to the particular side by which the attorney was employed. And just as a means of emphasizing the legal pleasantry about the accused person being innocent, the prosecuting attorney was given the place as valedictorian, so that his flights of oratory proclaiming the prisoner's guilt were the last things still ringing in the jurors' ears when they retired for deliberation, except to cut and dried platitudes read to them as a matter of form by the presiding judge.

Looking back at this particular proceeding from the lapse of a century one can appreciate the subtilty of the law's humor in considering the prisoner innocent until proved guilty beyond a reasonable doubt. Undoubtedly it seems more humorous to us now than it did to the prisoner at that time. But the results were not nearly so bad as one might suppose; for the third stage of the trial was yet to come. This was the socalled deliberation of the jurors.

Theoretically, you understand, each juror was supposed to have formed his opinion about the innocence or guilt of the prisoner from the statement of the witnesses and the bursts of legal oratory that had been forced upon him. And one would suppose very naturally, since he would hear no more of these things after being locked in the jury room, that his opinion expressed in his first vote would be his real opinion based on the evidence, and the only one that would be considered. But such was not the case at all. In point of fact, the first vote was rarely unanimous. And that was where the juror orator come into his own.

Perhaps, as the result of the first ballot, a majority of the jurors held to one opinion about the prisoner's guilt or innocence, while the remainder expressed precisely opposite views—this, you understand, based upon the evidence. Now it was up to the members of the jury to harmonize these conflicting opinions. And that was where convincing oratory came into play. Locked in a closed room from which none could escape the contesting orators representing one side or the other, tilted and jousted with each other, using every means at their command save actual physical violence (which, we believe, was not permitted in most cases) until at last one side prevailed over the other in the matter of convincing oratory and the jury was so harmonized that it voted unanimously.

In cases where there was one dominating orator on the jury a unanimous verdict was often easily attained. But when it happened that there were two equally matched lingual gladiators, or gladiatoresses, in the closed arena, the result was often indecisive, and the jury was said to be "hung," in the vernacular. When the jury was hung the prisoner wasn't.

All this strikes one as very childish. But we should remember that laws in the medical Dark Age were a heritage from the original Dark Age handed down directly and with little change. For law is essentially unprogressive.

This peculiar childishness in legal matters was shown in another way. Thus, the standard test of an accused person's mental responsibility the country over in this Dark Age, was whether or not he "knew right from wrong." In the case of serious crimes when the prisoner passed the "right from wrong" test successfully, he was hanged or electrocuted or otherwise dispensed with. If he failed in this test he was placed in a hospital or turned loose to try it again.

This right from wrong test should not be confused with the ordeal, or primitive sink or swim test, which really belongs to a much earlier period. According to this test the accused person was innocent if he sank and guilty if he swam when thrown into the water. And although this test was described minutely by Mark Twain, who was a contemporary of about that period, it should be understood as a legal measure in the Dark Age period. The law was, after all, somewhat progressive, you see.

As would be expected at this rather low stage of social development credulity was the dominant note. It appears that our worthy ancestors would believe almost anything, particularly if they saw it in print in the newspapers and if it pertained to the supernatural. Not all the members of our profession were exempt. For example, the great English physician writer, Dr. Conan Doyle, apparently overwrought by his experiences in the great war that had just passed, proclaimed some very curious conditions in the spirit world. As quoted from the contemporary newspapers of that time he is said to have discovered certain conditions existing in the hereafter, gave popular lectures on the subject, and upset many preconceived ideas of happiness in the Great Beyond by declaring that, "there are marriages in the spirit world, but no births." And, curiously enough, there were thousands of good Americans who accepted this idea of happiness, despite the fact it conflicted with the views of the great Roosevelt, who had only recently declared that marriages without births were likely to be doleful affairs, preeminently unhappy.

At this time, every person in America being "born free and equal" according to the great constitution, seemed to accept this untruthful impossibility as a fact. As a consequence, each person considered himself just as competent as any other person to pass upon any subject whatsoever. And as we would expect, there was some very childish legislation about medical things of which the general public had very inadequate knowledge, but which, with the willingness to rush in where angels might have hesitated, they passed without question.

Thus, there was the legislation about the use of opium and its products. At that time these products were the most useful remedies and the only ones that would control pain in many afflictions, besides being invaluable for other conditions. Yet, by a curious pieces of legislation, and despite the fact that doctors were considered the only persons competent to administer these remedies or decide when they should be administered, the control of the whole situation was placed in the hands of laymen. Some of the legislation that resulted was just what might be expected under the circumstances.

For example, since many of these remedies were used hypodermically, it was legally forbidden to sell, buy, or have in one's possession hypodermic needles or syringes except by special permission. And yet there were a host of remedies at that time could only be administered hypodermically, and that contained no opium products whatever. But since a small percentage of persons used hypodermic needles for administering morphine and heroine, everybody was forbidden the possession of hypodermic needles in the hope of preventing this inconsequential minority from taking drugs illicitly.

To be sure, the hypodermic needle was not necessary for the administration of these drugs and it was absolutely necessary for the administering of many other useful substances. So that the law which attempted to control the illicit traffic by forbidding the sale of one means of administering the drug was just about on a par with a law that would attempt to bring about starvation in a besieged city by forbidding the inhabitants to use knives or forks. It seems almost superfluous to say that this law did not decrease the amount of opiates used by the addicts. Meantime, however, it did interfere with the health and comfort of legitimate sufferers; and the whole legislative aspect was detrimental to the members of our profession. Criminal addicts, however, encountered no particular difficulties, as narcotics easily found their way into jails and pentitentiaries. Indeed, it has been shown that this sort of traffic was surreptitiously encouraged by those in authority in some institutions who found discipline was thus rendered a much easier problem for them.

The whole procedure of drug addiction control, from the legislators at Washington to the Federal courts and detectives and the arresting officers, concerned itself only with the legal aspects of the question. And the fact that drug addiction was almost exclusively a medical problem, seems to have been suspected by no one but certain physicians who were not permitted to concern themselves with the matter along scientific lines.

Moreover, that treating addicts as criminals appeared to increase criminality, seems not to have dawned upon the inner consciousness of the lawmakers and the law enforcers. Which is easily understood when we reflect that in the 1920 period criminal law was practised very largely on the procedures laid down in the eighteenth century. Law was indeed several centuries behind its own Dark Age.

One could continue almost indefinitely recounting the curiously childish things that concerned medicine either directly or indirectly which were constantly perpetrated in this Dark Age, but space forbids more than a passing reference to some of the most notorious. For example, some of the more markedly incompetents of that period who were, or had been, office holders by grace of the ballot, tried to discard Darwin's theory of evolution—the great foundation stone of all modern science and progress. Not only attempted to discredit it because mentally incapable of comprehending it, but attempted to forbid the teaching of evolution in public schools.

On one occasion a certain William J. Bryan, sometimes called the "Commoner" (a tersely descriptive term of that period) speaking in the Hippodrome in New York is quoted as saying: "They tell me that you can read the history of the earth in the records of the geological ages written in the rocks. As for me, *I* cling to The Rock of Ages!!" The audience "raised the roof" with applause—fourteen year old reasoning as pabulum for fourteen year old intellects.

It was the age when the reformer was still allowed at large and uncoralled—queer pathological types of both sexes, not always, however, clearly differentiated—who did not wish anybody to do anything that they did not enjoy themselves. Their idea seems to have been to transform all red blooded men into human cabbages oblivious to the fact that all the progress in the world has been produced by this same red blood. But of course they did not know this—did not, indeed, know many things that even modern boys of today know.

Yet these queer, mournful minded creatures with their obvious endocrine unbalance, had a tremendous following, and as would be expected, they were usually stoutly lined up against scientific medicine. But why not? Since any other mental attitude would have been a reflection upon the very name of science, in this curiously retrogressive period of our country's development when there was more crime, more degeneracy, and more general ignorance than recorded in several centuries—when the mind of the average citizen was the mind of a half grown boy, with all its foolish impetuousities, but without the saving grace of actual youth itself.

Editorial Articles

THE TREATMENT OF DIABETES

If the introduction of insulin has not altogether revolutionized the treatment of diabetes it has at least established a certain amount of control over the disease. An editorial and an address (*Canadian Practitioner,* March, last) have been published recently on the subject which place the part played by insulin in treatment in the proper light. The methods for extracting the substance secreted by the islands of Langerhans and the clinical trials on diabetic patients are described and then the value of the treatment is discussed. It is pointed out that insulin is not a cure for diabetes but seems to occupy a similar position in the treatment of diabetes that thyroxin occupies in hypothyroidism. In both cases there is a continued need for the missing secretion. There is no evidence at present to lead one to believe that destroyed islands of Langerhans can be regenerated, though there is ground for hoping that earlier pathological changes may be repaired. At the same time, it may be assumed that such tissue as is only functionally damaged may recover a large part or all of its capacity, because of the rest which it enjoys while the secretion is supplied artificially. The Allen treatment attains the same end in a different way. That this actually occurs in certain cases after the use of insulin evidence is already at hand to show. The writer of the editorial in the Toronto medical journal places his finger on the true therapeutic triumph of insulin so far, that is, its dramatic action in those cases where the patient is either actually in coma or hovering on the brink of that condition.

It may also be mentioned that insulin is of much value in its capacity to render a diabetic person in a safe state to be operated upon if necessary. The address commented on was given by Dr. Hugh Maclean at the Congress of Public Health held at Scarborough, England, on May 18, 1923, and published in the *Lancet,* May 26, 1923. This address entered fully into the subject but the statement on the value of insulin is so good that it may be quoted. Dr. Maclean said that he has now treated nearly twenty patients suffering from severe diabetes and in every case with entirely satisfactory results. No untoward symptoms of any kind occurred in any case. Patients who were almost moribund a few months ago are now back at work, and three subjects who were first seen while in a state of diabetic coma are now quite fit.

There can, therefore, be no question of the great value of the remedy. Its principal drawbacks are that it does not cure, but merely alleviates the condition while it is being given, and the fact that it has to be administered hypodermically. No doubt, in comparatively recent acute cases, its use may occasionally result in a return of tolerance, just as was sometimes the case with dietetic treatment, and Dr. Maclean has seen one case of this kind, but he goes on to point out that it is impossible to say whether the same result could not have been achieved by diet. Since, however, this boy was actually in coma when first seen, insulin was naturally used. He is now taking quite a large diet with one single small dose of five units of insulin a day, and is apparently normal with a resting blood sugar of about 0.1 per cent. and no glycosuria or ketosis. In long established disease he has seen no signs of increase of tolerance after insulin, and doubted whether in such cases much is to be hoped for in this direction.

What exactly the future of insulin will be it is impossible to say. That its advent has provided the greatest therapeutic measure in the treatment of diabetes is certain. Dr. Maclean thinks that probably many patients will ultimately learn to inject the drug themselves, or make some arrangement for a friend to do this for them. Insulin is almost exactly on the same footing as thyroid extract in the treatment of myxedema, with the disadvantage that insulin cannot be taken by the mouth. That it is capable of eliminating the symptoms of diabetes and restoring strength and energy to the unfortunate sufferer is now definitely established.

In short, insulin as it is now prepared is of considerable value in the treatment of diabetes and its potentialities cannot be gauged. The production is more satisfactory than was anticipated and it seems that the fear that it will not be forthcoming in sufficient quantities is not warranted. The standardization of the extract as to its strength is essential for its safe use, but no doubt this difficulty will be overcome, as will also the production of an extract whose action is spread over a longer period. Of course, the oral administration of insulin would greatly simplify treatment and while there are many difficulties in the way of producing an extract with the therapeutic virtues of insulin which may be given by the mouth these difficulties should not be insuperable. In fact, a pancreatic preparation to be given by the mouth was described by Dr. R. L. Mackenzie Wallis in the *Lancet,* April 14, 1923, and in the May 26th issue of the same journal Dr. Martin O. Raven records a case under his care in which satisfactory results followed the use of this preparation. Dr.

Banting and Dr. Best and their coworkers in Toronto are endeavoring to solve the outstanding problems in connection with insulin and it is likely that it will not be long before, at any rate, some of the difficulties will be mastered.

Before leaving the subject of the treatment of diabetes by insulin, it should be said that at present treatment with it requires knowledge and care on the part of the medical attendant. He must first convince himself that the case is one of true diabetes mellitus and then exercise great discretion. The rules for treatment by insulin laid down by Dr. Maclean are to be commended to the notice of medical men and especially that the principle of correlating diet to insulin doses must always be observed.

There should be no insuperable difficulties in the way of preparing pancreatic preparations of benefit to sufferers from diabetes which can be given by the mouth. Even if insulin cannot be so prepared and even if such preparations do not possess the potency of insulin, so long as they relieve to some extent, they will be useful. It is asserted that preparations of this nature are already to be obtained and from the account of Dr. Mackenzie Wallis's preparation this sounds as if it might be true. It is obvious that insulin as now administered is beyond the reach of many sufferers from diabetes. Indeed, now it is only the treatment of the few. The success of insulin has revealed in a striking manner the vast possibilities of scientific gland therapy.

HIGH AND LOW ENEMATA

With the desire of learning exactly what nurses of the present day are taught with regard to the administration of high and low enemata, S. W. Ellsworth and F. E. Wheatley (*Boston Medical and Surgical Journal,* April 12, 1923) sent letters of inquiry to the superintendents of nurses in twenty-seven of the larger hospitals in New England and New York, to which they received nineteen replies. One reply stated that the physicians and interns frequently requested a high or a low enema, but that this request made no difference in the method of administration. Five taught their nurses to make no distinction between a high and a low enema. Thirteen considered a low enema to be given when the recital tube or tip was inserted less than six inches, a high one when the tube was inserted more than six inches. In general, the replies showed that nurses were taught that a high enema was expected to flush the colon, and that this could be attained by inserting the tube to a greater distance.

These replies may prove illuminating to some physicians who have not obtained the desired results from the high enemata they ordered, for many observations made with the fluoroscope have proved that attempts to insert a tube more than six inches usually result in the production of a coil of tube in the rectum, and that when the tip does enter the sigmoid a muscular contraction is induced which prevents the entrance of fluids. Therefore all enemata given in this way are low.

Still it is perfectly feasible to flush the colon, as Ellsworth and Wheatley have demonstrated, by means of opaque enemata with x ray control. The method they have found most satisfactory is to have the patient lie face down, insert the tube just beyond the internal sphincter, usually about three inches, and inject the solution, heated to body temperature, slowly with a pressure produced by not more than eighteen inches elevation of the reservoir. When the patient feels any discomfort the flow should be stopped until the sensation has passed. In this way most patients can receive nearly two quarts of fluid by rectum with little or no discomfort, or even sensation, while sometimes the lower part of the ileum becomes filled. This is a high enema.

MEDICAL EDUCATION

Education is an experiment and medical education is as experimental as any other form. The experimenters, the teachers of a subject, get notions in their heads from time to time and change their methods accordingly, lest one good custom corrupt the educational world. One generation of medical pedagogues starts its students of anatomy with the skin and works them down to bone; another starts with bone and works outward to integument. One generation teaches by lecture, the next by text; full time professors are in vogue one year and looked upon with suspicion the next. One generation thinks the course of study too brief and the next considers it too long. Hitherto the student has been driven to absorb as much as possible throughout his course; recently we hear of letting him "work out his own ideas for himself." Verily, unless human nature has mightly changed, these students, even at the baldheaded age to which medical students have now attained, are not in the least prepared for working out their own medical salvation. The teacher has failed to place himself in the student's place, but is thinking in habits of his own age, experience and enthusiasms.

After all, it is neither the medical curriculum nor the medical student that make the good doctor. It is the man himself. The man behind the book or instrument and the man beside the sick bed. When it comes to the research worker perhaps it does not make so much difference, but even these scientists are born rather than made. The addition of a few years of attendance at college to his educational career does not in the least make the student more suitable timber, either for research or practice.

More than anything else in medical training, selection, natural or artificial, would be of the greatest advantage, both to the student and to society. As it is, a considerable percentage of medical students are dropped, because the examinations show them unfitted for medical work, while others, who, from general intellectual ability, pass with credit, find the work on which they enter uncongenial and not at all what their imagination pictured it. In the words of —was it Councilman? "the study of medicine is heaven but the practice is hell."

In the "good old days" an early selection did take place. The prospective medical student had his first lessons with the physician who served as his tutor. He not only read in his office but visited the sick with him, and assisted in emergencies. He knew what the business was like, and whether he liked to be a doctor, before he went to a medical school. If he did not like the work or did not get on well with it he went into other business.

This natural means of selection is gone forever or at least for the time being; in its place some psychological test may possibly be invented to serve the purpose. Still, there is nothing like the reality, and the prospective student may well be urged by his physician friend, or educational adviser (if there be such in this day of educational mills) to do service for a season as assistant to a physician, in a dispensary, or in some other capacity where he may come into first hand contact with sickness and with the sick, and learn what it is like before spending much time and money in studying for the profession.

PNEUMONIC PLAGUE

Pneumonic plague is raging in India where thousands are dying weekly from the disease. Perhaps this epidemic is only of academic interest in this country from the medical viewpoint, although there is the chance that it may be introduced into California, unless the most stringent care is taken to exclude it. From the humanitarian aspect the prevalence of plague in Asia is of worldwide concern and it is to the interest of the race that means should be found to control the disease and if possible extirpate it. The control or extirpation of the plague is mainly a medical problem and on account of the conditions prevailing in Eastern Europe, and in Turkey and Greece in particular, the prevalence of the disease is a menace to Western Europe and possibly to this country.

In the *China Medical Journal*, January, 1923, a journal published monthly by the Medical Missionary Association of China, is an account by J. W. H. Chun, M.B., B.C. (Cantab), M.R.C.S., L.R.C.P., of the epidemic of some of the salient points of the pneumonic plague in Harbin, Manchuria, in 1921. The first epidemic in Harbin occurred in 1910-11 when the death rate was much higher than that in 1921. In fact the plague mortality in the whole of Manchuria in 1910-11 was six times greater than in the latter year. Dr. Chun assigns this remarkable change to three causes: 1. The existence of a permanent antiplague service; 2, the willing and enthusiastic report of the Chinese authorities; 3, the active cooperation of the officials of the Chinese Eastern Railways and of the Russian doctors with the Chinese staff.

Some research work was done among the contacts, and it was found that two men were plague carriers. Experiments on the action of different antiseptics on plague sputum showed some instructive facts. It was found that methylated spirit or absolute alcohol killed Bacillus pestis in three minutes. When the sputum was mixed with lime and left for thirty minutes, no growth could be obtained, while perchloride of mercury one to five hundred did not kill Bacillus pestis in sputum under ten minutes.

With regard to treatment, nothing was of avail. Two early cases were treated with antiplague serum in large doses both intravenously and hypodermically. Four early cases were injected with novarsenobillon in 0.9 doses. Intravenous injections of ensol, electrargol, formalin, sodium gynocardate and carbolic acid per os, were all tried and failed.

It would seem that preventive measures must be relied on for the abolition of plague and on account of the opposition of the people it is, at present, impossible to put these into force. The only measures which can be used are to control the epidemic as effectively as can be done with the means at hand to restrict the range of the epidemic by all available methods and especially to prevent any infective cases from leaving the country. Of course, ruthless war should be waged upon rats, which are the chief conveyers of plague.

A NEW EPOCH IN THE CARE OF THE INSANE

At last it seems as if mental disorders are to be treated with that amount of intelligence which their importance demands. That is to say, that all forms of mania are not to be classed as incurable but efforts are to be made to treat the early stages of certain mental disorders in such a manner that they may be prevented from developing into a serious condition. In this country beginnings in this direction have been made already, as most of the large American hospitals have a ward in which those who are suffering from mental derangement are kept under close observation by skilled medical men so that their affection may be classified and treated accordingly. The old conception of mental malady is dying out and with it the old not infrequently inhuman mode of treating these unfortunate mentally sick persons. It is now recognized that some forms of mania arise from a physical cause, if not wholly so at least in part, while in some cases the sick mind proceeds directly from a sick body.

With regard to dementia precox, Dr. White Robertson, a well known Scotch alienist, states that it is brought about by intestinal stasis, which causes a toxemia of the spleen in which the mental faculties are often involved. These views are supported by many distinguished British physicians and surgeons and is in strict keeping with the new trend of medical treatment initiated and developed by Sir James Mackenzie, who teaches in and out of season that in order to treat disease with any hope of success, symptoms must be to some extent overlooked and the primary cause must be diagnosed and treated conscientiously. Correct diagnosis of the originating cause of a disease is the most essential point and he who is a good diagnostician is best equipped for the work of a physician, although it must be said that the quick and reliable diagnostician is a good deal akin to the poet, "born, not made." However, if it is granted that the diagnosis and treatment of the primary cause is the most important factor for success in medical practice, and who will deny this, and if it is true that dementia precox is caused largely, if not entirely, by intestinal stasis, it naturally follows that the rational treatment of the mental disorder is to sap its progress by efficiently treating intestinal stasis. It may be mentioned that perhaps the majority of those affected mentally suffer also from disorders of the gastrointestinal tract. May it not then be well within the realms of reason to suppose that other forms of mental aberration or even disease may have their origin in a physical cause, more often than not engendered and in all cases aggravated by gastrointestinal disturbances. In any event, the recent methods of dealing with the insane, of carefully observing them in order to discover if possible the origin, physical or otherwise, of the condition and of treating this originating cause by the best known means at hand, is an epoch making new departure.

The history of the insane and their treatment make at one and the same time a fascinating and grewsome study. Up to the closing years of the eighteenth century the treatment of those disordered in mind in civilized countries was barbarous in the extreme. At the time when Jenner was conquering smallpox, the humane treatment of the insane was begun. Independently and simultaneously, the French physician Pinel and the British Quaker philanthropist Tuke instituted much needed reforms into the management of asylums. Until these men by their energy and enthusiasm were the means of the prison systems of France and Great Britain being altered for the better, nowhere in the world had the victims of mental disease been treated with kindness and a certain amount of intelligence. The examples of France and Great Britain in this direction have been followed in civilized countries and at the present time, it may be said without boasting that this country is easily in the van, so far as the treatment of the mentally afflicted is concerned and that the pioneers have been left far behind in the race to improve mankind.

Another step forward has been made recently in Great Britain. Dr. Henry Maudsley, whose specialty was the treatment of the insane, died some years ago, leaving a large sum of money made over to the London County Council for the foundation and endowment of a hospital for the insane conceived on original lines. Dr. Maudsley, somewhat before his time, was one of those who realized that those termed insane were really sick and required special treatment and special solicitude and he founded and endowed this hospital so as to carry into effect this particular object. The hospital, situated in a healthy suburb of London, consists of an outpatient department and 157 beds for inpatients, in addition to a considerable number of private rooms. The hospital is associated with the pathological department of the London County Mental Hospitals under the direction of Sir Frederick Mott and is adequately equipped for up to date treatment and for carrying on research.

It appears that we are well on the way towards understanding that mental disorder or, at least certain forms of it, proceed from natural causes and we also seem to be on the road towards discovering what these causes are. If diagnosed in time and the causes efficiently treated these forms may be arrested just as other diseases may be arrested if the primary cause is discovered and properly treated in a sufficiently early stage. As said before, a new epoch in the treatment and care of the insane has arisen and is developing. The treatment and care is based on common sense and it may not be too much to predict that mental hygiene will soon be as far ahead of existing methods of treatment as is the treatment nowadays in advance of that practised in the time of Pinel and Tuke.

OLD CURES FOR NEW

So many means have been tried for the cure of consumption that it is little to be wondered at if one of them which is put forward for a second time should seem to be new. We refer to the recommendation of inhalations of coal dust or of carbon in other form for the cure of this disease.

This sort of treatment was tried in Europe a half century since but the results do not seem to have been at all startling. In 1885 Professor Pepper, of the University of Pennsylvania, made a questionnaire study of the relation of climate in Pennsylvania to tuberculosis and malaria. In a letter on the subject received from Dr. Matins, of Luzerne County, we read: "I have known many persons apparently in decline entirely cured by inhaling the dust of the coal mines and the smoke from lard oil lamps." It is unfortunate that the correspondent did not give more accurate figures as to just how many were cured, but evidently the numbers were not sufficient to attract large interest in the socalled cure.

It was noted in England long ago that the death rate or percentage of deaths from tuberculosis among coal miners was only about half what it was among workers in other occupations. In this country the same holds true, especially among anthracite miners. The Metropolitan Life Insurance Company's experience with miners (1911-1913) gave a percentage mortality of 5.8, while for all occupied males the percentage was 20.5. These latter figures must be modified on account of the high percentage of violent deaths, but even so the percentage of deaths from tuberculosis remains very low.

While from these figures there might seem to be some ground for faith in carbon dust as a cure for consumption the proportion of disease of the respiratory organs is relatively high, so that while the coal inhaler may escape consumption (or consumption in its ordinary form) he is prone to miner's asthma, chronic bronchitis, or other disease due to anthracosis. In escaping Scylla he encounters Charybdis.

It is certain that the effects of breathing coal dust upon the tuberculous process is radically different from the effects of silica dust. Coal miners are protected against tuberculosis to a certain degree. Stone workers are very subject to it and die early. The difference in effect has been attributed of late to difference in chemical reaction of the two substances upon the lung tissues rather than to any difference in mechanical action. The lime in the coal has been given the credit for the inhibition of tuberculous activity, but the amount of lime is very small indeed. Whether the sulphur is of service in this connection has not been determined, but it is present in large amount compared with lime and certainly deserves to be taken note of.

As a cure for tuberculosis the inhalation of coal dust certainly is not to be recommended, but from its evident effect upon the lung in those who must breathe it, it deserves study in the hope that, in some other way, the introduction of carbon, sulphur, lime, or whatever, in coal reduces the mortality from the disease, may be of use in its treatment.

MALE AND FEMALE MORTALITY RATES

A condition prevailing quite generally throughout the civilized world has always been that the death rate of males has been found to be higher than that of females at every age period from birth until death. In one of its studies, the Metropolitan Life Insurance Company has found that this supposedly fixed relationship may be changing. In 1911, the mortality of the white males studied in the report was more than thirteen per cent. higher than that of the females. Up to and including 1918, this condition persisted with slight variations. In 1919, the excess dropped to about five per cent.; while in 1920, a reversal of the relationship occurred, with female mortality 2.6 per cent. above that of males. In 1921, it was still 1.2 per cent. above. In 1922, however, the condition was changed to an excess of 1.2 per cent. in male mortality over that of female. Similar relationships, it is stated, are indicated in the figures of the registration area during the corresponding years.

What these changes may mean, the report goes on to say, it is still difficult to say. Three items are mentioned as having a possible bearing on the situation—the reluctance toward improvement of the maternal death rate, the increased maternal mortality during the influenza outbreak, and the fact that there has occurred a much greater decline from pulmonary tuberculosis among males than among females. This last point is probably the only one that may be taken as being at all decisive, for it is too early to draw any general conclusions as to the other conditions, and new factors may suggest themselves as future changes occur.

The report suggests that students of public health observe the phenomenon in their respective areas and note whether or not the conditions described have been general or localized. It is possible that the condition is temporary only and may not occur again.

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News Items.

Birth Rate Drops, Death Rate Rises.—A decline in the birth rate and a slight increase in the death rate in 1922 was shown in provisional census bureau figures for the year announced today by the Department of Commerce. For the twenty-four states reporting birth figures, the rate for 1922 was 22.7 for each 1,000 of population, against a rate of 24.4 for 1921. For thirty-three states the death rate last year was 11.9 against 11.6 for 1921. North Carolina reported the highest birth rate, 30.2, while a rate of 18 for the State of Washington was the lowest. Death rates in the thirty-three states ranged from 14.7 for Maine to 8.1 for Idaho.

Heads McGill Medical School.—Dr. C. F. Martin was appointed Dean of the Faculty of Medicine of McGill University. He succeeds Dr. George Armstrong, resigned. Dr. E. W. Archibald was named professor of surgery and director of the surgical department of the university.

Aid Insulin Committee.—The Insulin Committee formed recently to provide free treatment with insulin in emergency cases to patients suffering from diabetes, reports hearty response to the few appeals it has sent out. A number of hospitals have already made applications for sums to be used for special cases.

Dr. Pedersen Robbed.—Sneak thieves are again visiting physicians. Dr. V. C. Pedersen, 45 West Ninth Street, has in this way been deprived of a nickel plated case marked "Special" on the cover outside, and again on the bottom inside, containing about $150 worth of urethral catheters and accessories. If this box is presented at any physician's office, aid in the arrest of the culprit will be appreciated.

Dr. Goldthwait Called.—Dr. Joel E. Goldthwait, professor of orthopedics at Harvard and one of the foremost surgeons in America, was called to active service from the organized reserves with his rank of Brigadier General in the Medical Corps for duty at the citizens' military training camps, in orders issued byMajor General Robert L. Bullard, commanding the Second Corps Area, at Governors Island.

An Appeal for Information on Maternal Welfare.—The Committee on Maternal Welfare of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons is anxious to procure accurate information as to the progress each State is making in the matter of Maternal Welfare in order to formulate a report for their annual meeting in Philadelphia, in September. Dr. George Clark Mosher, chairman, Bryant Building, Kansas City, Mo., has the matter in charge.

Cancer Cases Tripled in French District.—Almost a tripling of the number of persons suffering from cancer has been reported in the District of Toulouse during the last four years, according to a communication read in the Academy of Science by Professor Romond, of the Toulouse Faculty of Medicine. The statistics cover 694 localities in eight departments. They show that the number of sufferers from the disease in 1919 was 300, and that the number increased to 362 in 1920, 585 in 1921, and 846 in 1922. For the city of Toulouse the increase in the four years was from 22 to 126 cases.

Medical Society of New Jersey.—At the one hundred and fifty-seventh annual meeting of this society, held in Atlantic City, June 21st to 23d, the following officers were elected: Dr. Willis P. Eagleton, Newark, president; Dr. Alexander MacAlister, Camden, first vice-president; Dr. Archibald Mercer, Newark, second vice-president, and Dr. Lucius F. Donahue, Bayonne, third vice-president; recording secretary, Dr. John Bennett Morrison, Newark; corresponding secretary, Dr. William J. Carrington, Atlantic City, and treasurer, Dr. Elias J. Marsh, Paterson. Next year's meeting will also be held in Atlantic City.

Dental Clinics Aid Million in Schools.—Continuance of dental clinics in school buildings, rather than in centres where a number of schools could be served, has tended notably to increase success of school dental work, the Department of Health reports in its monthly bulletin. The number of dental clinics established by the Department of Health has steadily increased and at present there are twenty scattered throughout the five boroughs as follows: Five in Manhattan, four in the Bronx, six in Brooklyn, three in Queens, and two in Richmond.

Maternity Hospital to Build on Fifth Avenue.—The Jewish Maternity Hospital has purchased four lots at the northeast corner of Fifth Avenue and 108th Street, on which it will erect a twelve story hospital building to cost about $750,000. The site has a frontage of 75 feet on the avenue and 125 feet on 108th Street. The new hospital as planned will include 150 beds, almost three times the capacity of the present building at 270 East Broadway, and will include laboratories for research. More than $1,000,000, most of which has been raised by subscriptions, will be involved in the transaction.

Foreign Medical Congresses.—The program for the next congress in Brussels of the French Association of Pediatrics has already been announced. The congress takes place in September. The congress of the Association for French Gynecologists and Obstetricians will be held on August 9th to 11th in Geneva; The National Association for the Prevention of Tuberculosis will hold its ninth annual meeting in July in Birmingham, England; The National Association for the Prevention of Infant Mortality and the National Baby Week Council will hold a joint conference on infant welfare in London on July 2nd to 4th.

Rockefeller Institute Appointments.—The board of scientific directors of the Rockefeller Institute for Medical Research has announced the following promotions and appointments for the coming year: Dr. Oswald T. Avery and Dr. Walter A. Jacobs, associate members, have been made members; Dr. Michael Heidelberger, Dr. Christen Lundsgaard, Dr. Peter K. Olitsky, and Dr. Louise Pearce, associates, have been made associate members; Dr. David I. Hitchcock, Dr. Frederic M. Nicholson, Dr. Henry S. Simms, and Dr. Leslie T. Webster, assistants, have been made associates, and Dr. Mimosa H. Pfaltz, a fellow, has been made an assistant.

The following new appointments are announced: Associate members, Dr. Jacob J. Bronfenbrenner and Dr. Paul A. Lewis; associates, Dr. Oskar Baudisch, Dr. Stuart Mudd, and Mr. Herbert L. J. Haller; assistants, Mr. Arnold M. Collins, Dr. John H. Crawford, Dr. Robert Elman, Dr. Joseph H. B. Grant, Mr. Moses Kunitz, Dr. Cecil D. Murray, Dr. Everett S. Sanderson, Dr. David T. Smith, Mr. James Vander Scheer, and Dr. Lars A. Welo; fellows, Miss Gladys Bryant, Dr. Charles Korb, Miss Dorothy Loomis and Dr. Elmer L. Straub. Dr. J. Howard Brown, an associate in the department of animal pathology, has accepted a position as associate professor of bacteriology at Johns Hopkins Medical School, Baltimore, Md. Dr. Fred A. Taylor, an associate in chemistry, has been made head of the department of biochemistry at the William H. Singer Memorial Research Laboratory, Pittsburgh, Pa.

LONDON LETTER

(*From our own correspondent.*)

London, *July 5, 1923*

THE CANCER CAMPAIGN IN GREAT BRITAIN.

A campaign against cancer has been inaugurated and is in progress in this country, and although belated, it appears that the fight against the disease will be waged with persistency and vigor. It is recognized that cancer is increasing, that it is a public menace, that money spent in research is money well spent, and that money expended in an educative propaganda is well worth while. A call to arms has been issued in the shape of a letter to the lay press signed by leaders of the medical profession and other well known men, among them being Sir Napier Barnett, head of the Hospital Service of the British Red Cross. Lord Dawson of Penn, physician in ordinary to the King; Sir Thomas Horder, physician at the Cancer Hospital, Fulham; Mr. J. P. Lockhart Mummery, F. R. C. S., senior surgeon at St. Mark's Hospital for Cancer, and the Hon. Sir Arthur Stanley, chairman of the Joint Council for the British Red Cross Society and the Order of St. John of Jerusalem.

In the letter referred to, it is stated that cancer, in spite of the advances which have been made both in diagnosis and treatment, is still the most common single cause of death in persons over thirty years of age, and is becoming so in an increasing degree. During 1920, in England and Wales, nearly forty-three thousand persons of thirty years and upwards died from cancer. In 1921, the last year for which the Registrar General's figures are available, the corresponding number was 45,328. During that year one in every seven deaths from the age of thirty onwards was caused by cancer. We are still ignorant both of the causation and cure of cancer. Many other diseases have yielded their secrets to patient investigation, and there is no reason to suppose that the problem of cancer will not eventually be solved. Yet thousands of suffering men and women, and those who suffer with them, are asking how long they must wait, and if there is nothing that can be done to hasten a discovery which will bring relief to those whose outlook is today so hopeless. The tenor of the letter of appeal is for funds to be spent chiefly in research work, laboratory and clinical, to found a movement which will coordinate and support research in cancer throughout the British Empire.

As Sir Thomas Horder has pointed out, it is intended that the money subscribed to the fund for the prosecution of the campaign against cancer shall be received through the Red Cross Society, which has placed its organization and machinery at the disposal of the council of the campaign. It is not only a question of laboratory research, there are also the large questions of accurate statistics of clinical bedside observations, of the collection and classification of literature for reference, and of the critical examination of methods of treatment advanced by members of the profession and laymen.

Sir Thomas Horder characterized the province of the executive committee as that of a clearing house of information regarding all aspects of cancer and he laid stress on the value of team work in solving a problem of this nature. It should be said that the council disclaims any intention to interfere with the work already being carried out. Individuals and institutions now working on the cancer problem will be helped and encouraged, and where practicable financially assisted. In this way investigation can be carried out simultaneously along many lines, and the results of these inquiries will be brought into the common stock of knowledge. A discovery in any one branch will be made known to all, and may lead to discoveries in other branches. It is from this coordination of effort that the best results are hoped for.

One of the individual workers in cancer research is Dr. J. Shaw Mackenzie, who for several years in the laboratories of King's College, London, has been carefully and patiently working on his theory that in cancer there is defective lipolysis and utilization of fats, with excess of blood fats and lipoids, and that the treatment indicated is to stimulate lipolysis in the tissues.

The Federation of Medical and Allied Services has had much to do with inducing the public to interest themselves in health matters and, as its president, Sir Berkeley Moynihan said at the annual dinner held in London on May 29th last, that if cancer was only to be cured by early diagnosis it was essential that the public shall be educated to recognize the early signs of cancer. The public in this country are ignorant of the benefits to health to be derived from the carrying out of medical research. Not understanding its value they are inclined to believe that money expended in this direction is money more or less wasted. The community must be educated to appreciate the gain to the general health brought about by medical research and it is fitting that such education should begin with cancer, the most deadly and increasing disease of civilized people.

THE ROCKEFELLER GIFT TO UNIVERSITY COLLEGE.

On May 31st last the King and Queen visited University College and University College Hospital, London, for the double purpose of laying the foundation stone of the new obstetrical hospital and of opening the new anatomy building of University College. The Rockefeller Foundation gave £1,205,000 to University College and University College Hospital to enable a scheme for the advancement of medical teaching and research in this country to be carried out, of which the new building for anatomy, and the new obstetrical hospital and nurses' home are part. The King in his speech pointed out that there can be but few instances on record in which any institution like University College and Medical School has received such a sum from a single benefactor in a single gift. And the magnificent generosity of the Rockefeller trustees is the more impressive since it is bestowed by a citizen of the United States upon a college and hospital in London, and thus upon the people of Great Britain and the Empire. We understood that this college and medical school were selected by the Rockefeller trustees for their benefaction from among many equally distinguished institutions, partly because the situation was factor in a single gift. And the magnificent gener- partly because the close connection of the hospital and medical school with the college provided favorable opportunities for that intercourse between medicine and other branches of learning which was the surest defense against the evils of a narrow specialism. But he also understood that the trustees were chiefly influenced by the establishment at this college of what had come to be known as the unit system of medical teaching, and that being convinced of the value of this reform, they desired to supply the resources for carrying it out in an English university on a scale worthy of its importance both to education and research. The King then gave a description of the unit system.

The Queen expressed her great satisfaction at the establishment of the obstetrical unit and of the maternity hospital of which it formed a part. The present position of the care of maternity and infant life in this country was not wholly satisfactory, and there was no doubt that every year many lives were lost in childbirth and many women suffered injuries to health which might be prevented if better facilities for treatment were available. Two of the main requisites for bringing about a better state of affairs were to ensure that medical men were well and efficiently trained for their work and to provide maternity hospitals in which patients might be received. The Queen expressed her gratification that the claims of the nursing service had not been overlooked, provision having been made for the establishment of a new nurses' home.

No representative of the Rockefeller trustees was able to attend, but Mr. Post Wheeler, councillor of the American Embassy, came with his wife, and Dr. G. G. MacLean, director of the American University Union in Europe, was also present.

BIRTH RATE AND DEATH RATE IN GREAT BRITAIN.

In the three months, January, February, and March of this year, the birth rate in England and Wales was the lowest for any first quarter since the war. According to the Registrar General's returns the births registered numbered 192,970 or 14,603 fewer than in the corresponding period of 1922. This figure represents a rate of 20.5 per 1,000 of the population and shows a heavy decline from the record of 29 in 1,000 attained in the first quarter of 1920. The death rate for the quarter, at 13.3 in 1,000, also established a new record.

LATIN AMERICA LETTER.

(From our own correspondent.)

BALBOA HEIGHTS, *June 20, 1923.*

BUBONIC PLAGUE.

So far as the Panama Canal is concerned, bubonic plague is an ever present sanitary menace. Yellow fever has been relegated to hygienic oblivion; typhus has never gained a foothold in a moist sea level climate; smallpox can not spread where vaccination is enforced; cholera can not become epidemic in an environment with a good water supply and adequate sewerage, but there is always the danger that if plague should penetrate the line of sanitary defence maintained by the Health Department of the Panama Canal that it might extend to the jungle rats and create an ineradicable pest focus which would permanently injure an international industrial plant in which the American people have invested over half a billion dollars. Plague is essentially a seaborne disease, hence seaports are ever exposed to it and the Panama Canal, as the focus to which converge the lines of maritime commerce, if without adequate sanitary protection would therefore be exposed to infection from almost every quarter of the globe.

At the present time bubonic plague is a major pestilence of worldwide distribution. During the calendar year 1922 either human or rodent cases have been reported in California, Mexico, Ecuador, Peru, Chile and Brazil, in the Western Hemisphere; in Europe, in Great Britain, France, Portugal, Spain, Greece, Turkey and on the Island of Rhodes; in Africa, in Egypt, Algeria, Tunis, the Azores and Cape de Verde Islands, Senegal, Portuguese West Africa, the Union of South Africa, Madagascar, British East Africa and Mauritius; in Asia Minor, in Smyrna, Mesopotamia, Palestine and Syria; in Asia, in India, Indo-China, Siam, Ceylon, Java, the Philippines, China and Japan; Australia and Hawaii are also infected.

How very real this danger is may be shown by the fact that from January 1 to 31, 1923, there occurred in Peru alone 151 cases of bubonic plague with fifty-nine deaths. The cases were distributed through twenty localities many of which were far apart. The Panama Canal is taking every precaution for the exclusion of the disease from its territory. All wharves and docks are of rat proof construction and by constant use of traps and poison the rodent population is kept in check. Ships are required to breast off from wharves and to apply satisfactory rat guards to all mooring lines. Unprotected hose lines, savealls and the like must be raised at night and gangways either raised or guarded by a watchman. All ships docking at Panama Canal ports must be fumigated at stated intervals for the destruction of rodents. Vessels destined for Panamanian ports are required to enter through Canal ports thus ensuring for the republic the same protection as the Canal Zone itself receives. There has been a consistent policy on the part of the Health Department to assist and stimulate other countries to attack their plague eradication or prevention problems and a fine spirit of cooperation has been thus secured between the health authorities of the Canal and those of nearby countries. In this mutual notification and uniformity of quarantine procedure has been secured.

LAYING THE CORNERSTONE OF THE GORGAS MEMORIAL INSTITUTE.

To those who live out on the fringe of things it is a great deprivation to lose contact with fellow workers in the profession at home. It was therefore with great joy that a committee of local Fellows of the American College of Surgeons, comprised of Dr. Augusto S. Boyd, Dr. A. B. Herrick, Dr. R. W. Runyan, Dr. T. W. Reeder, Dr. E. A. Bocock, Dr. H. C. Fisher, Dr. W. C. Rucker, Dr. H. A. Webber, Dr. D. S. Fairchild, and Dr. T. J. Leary, on the morning of February 18th met the *S. S. Vandyck* with a party of 115 Fellows of the American College of Surgeons and 140 friends and wives aboard. The party was taken to Gatun Locks by special train and after inspecting the locks and spillway, again boarded the train and proceeded to Gamboa, where the tug *Favorite* was taken through the cut to Pedro Miguel. Thence the party went to Panama by train. In the afternoon they took part in the laying of the cornerstone of the Gorgas Memorial Institute of Tropical Medicine in the City of Panama, the exercises being conducted under the direction of the chairman of the local committee, Dr. Augusto S. Boyd.

The institute is to occupy a point of land jutting out into beautiful Panama Bay and will adjoin the grounds of the new Santo Tomas Hospital, which is being erected by the Republic of Panama. The exercises took place in a flag covered stand, in the centre of which stood a bronze bust of the late Major General William Crawford Gorgas, M.C., U. S. A., to whom the institute is to be a memorial.

His Excellency, Dr. Belisario Porras, President of the Republic of Panama, made the dedicatory address, in the course of which he said: "Gorgas destroyed the morasses of death and redeemed the tropics. I can still remember, and it seems to me a horrible nightmare, the time fifty years ago when on my way to Bogota to finish my studies I found it indispensable to spend the night in Colon. Sleep during that night was impossible for me because of the constant and tormenting bites of the mosquitoes whose incessant buzzing smote on my ears as though they were the discordant notes of an infernal serenade. Those minute tormentors were so numerous that by clutching at the apparently empty air I caught handful after handful of them. Neither can I forget conditions as they prevailed when I returned from college ten years later and entered the employ of the French Canal Company. From that time I was able to realize, or at least suspect, the underlying cause of the Frenchmen's failure in their attempt to construct the trans-Isthmian waterway. They constructed beautiful residences and tree lined avenues and admirably organized their offices; but they did nothing, in fact they knew nothing, about tropical sanitation and apparently never suspected its worth. Thanks to Gorgas, those days have passed never to return, and our tropical home has become one of the world's health resorts. The monument which we shall erect here will be an expression of Panama's gratitude to the man who proved beyond peradventure of a doubt that the tropics could be made habitable for all races."

Dr. Boyd spoke on behalf of the local profession and Dr. Franklin H. Martin for the American College of Surgeons and at the close of the ceremonies bronze commemorative medals and pamphlets, containing President Porras's address in Spanish and English, were distributed. In the evening President and Mrs. Porras held a reception for the visitors at the Palace, at which time Dr. John G. McDougall, of Halifax, the second vice-president of the college, conferred the Honorary Fellowship on Dr. Augusto Samuel Boyd. The visiting surgeons and their party sailed for Cartagena, Colombia, *en voyage* to Buenos Aires, the following day.

Although the Panaman Republic has not yet constructed the buildings which the institute is to occupy, and the endowment fund which the citizens of the United States are to raise is believed to be still incomplete, the scientific director of the institute, Dr. Richard P. Strong, is on the ground and it is reported that he will begin actual research work very shortly in the new laboratory building of Santo Tomas Hospital. The laboratory, which is one of the five completed buildings of the twelve which will comprise the new Santo Tomas Hospital, is a two story concrete structure adequate in size for all the work of the hospital and at the same time to perform the functions of a board of health laboratory for the republic. It contains a morgue, autopsy room and crematory in addition to the usual work rooms of a laboratory. The venereal, isolation, tuberculosis and maternity wards are of the best modern construction and equipment, and are completed. The completed hospital will cost $3,000,000 and will have 900 beds. It will replace the original Santo Tomas Hospital, which was begun in 1696.

RECENT CANAL ZONE VISITORS.

Among the distinguished medical men recently visitors on the Canal Zone were Dr. Lewis Stephen Pilcher, editor of the *Annals of Surgery;* Dr. Victor Heiser, of the International Health Board; Dr. Oscar Dowling, State Health Commissioner of Louisiana; Dr. Truman W. Brophy, of Chicago, and Dr. Samuel J. Mixter, of Boston. The maneuvres of the United States Fleet also brought Captain James C. Pryor, M.C., U.S.N., Fleet Surgeon of the United States Fleet, and Captain William H. Bell, M.C., U.S.N., Fleet Surgeon of the Battle Fleet.

LETTER FROM GENEVA

(*From our own Correspondent*)

Geneva, *March 20, 1923.*

POSTTRAUMATIC PULMONARY TUBERCULOSIS.

More work on posttraumatic pulmonary tuberculosis has been lately accomplished at Lyons, a good deal of it having been carried out by Dr. C. Euthymion, who finds, as others have, that this condition is uncommon following penetrating wounds or severe contusions of the thorax. These lesions may play an important part in revealing or aggravating a preexisting tuberculosis, although latent. It is, however, maintained that thoracic contusions and the inhalation of asphyxiating gases have a more marked phthisiogenic action than bullet wounds, a conclusion reached after a study of 737 cases.

It may be recalled that Sergent, of Paris, whose experience during the war was vast, has also pointed out the infrequence of pulmonary tuberculosis following thoracic wounds, placing it at 9.04 per cent., and he is of the opinion that it is not the trauma *per se,* but its consequences that open the door to tuberculosis. The delicate question to decide is clearly the right interpretation of a real causality between the trauma and the signs of tuberculosis observed, after a careful examination, which should eliminate all cause of error. The first symptoms must develop rather soon after the receipt of the injury, while the lesions discovered must not be those of a somewhat advanced tuberculosis, if any relation exists between the trauma and the tuberculous process.

Euthymion was able to follow his cases systematically immediately after the injury, so he admits that the date of the onset of the pulmonary process must be the time when bacilli are first detected in the sputum or at the time of military revision. Thus understood, the lapse of time between the receipt of the trauma and the detection of the tuberculosis is variable, extending from one to twenty-three months, which is evidently the maximum. The duration of the real period should be below this maximum.

As to the seat of the tuberculous localization, in direct traumata—wounds or contusions—it in most instances corresponds with the area of the injury or its neighborhood, but it may arise at a somewhat distant point from this. Following the inhalation of asphyxiating or irritant gases the lesions are usually to be found at the apex following upon a phase of acute bronchitis. Other than for its etiology, there is nothing which distinguishes posttraumatic tuberculosis, from the clinical or pathological viewpoint, from the various forms of the affection due to other usual etiological or pathogenic factors of this malady. As to the evolution of these traumatic pulmonary cases, it would appear that they offer three rather distinct forms: 1, an evolutive form, the most frequent, similar to the classical fibrocaseous type; 2, an acute or subacute form progressing rapidly to death, and, 3, an abortive form ending in an apparently complete recovery in a few months with disappearance of the local signs. The postgaseous cases present a congestive onset with hemoptysis; the lesions either extend rapidly or the process may become abortive in a very short time and recovery take place. To differentiate it from a nontuberculous bronchitis animal inoculation must be resorted to.

ARSENICAL PREPARATIONS IN SYPHILIS.

Too much consideration cannot be given to the arsenical products at present so extensively used in the treatment of syphilis, and for this reason attention should be given to some recent utterances of Milian, of Paris, who has done so much to advance this treatment. The first precaution, when giving an intravenous injection, is to give it slowly, and Roger's experiments in this direction are conclusive. This rule is imperative in the administration of the arsenobenzole because, when they give rise to accidents, these occur quickly.

Let us suppose that a nitritoid paroxysm arises one or two minutes after the beginning of the injection. If the latter has been given slowly—and the solution well diluted as it should be—since it requires about ten minutes to complete the injection, this can be stopped the minute the first symptoms appear, thus controlling the intensity of the paroxysm. On the other hand, if a concentrated solution is used, the probability will be that most of the drug will have entered the circulation when the attack begins, so that all control over it is lost, and Milian very correctly says that injections made by Ravant's technic cannot be given with the necessary slowness.

Dilute solutions only should be given and precautions similar to those employed against anaphylaxis should be taken, by first injecting one cubic centimetre of the solution, and then waiting about fifteen seconds and injecting another cubic centimetre. Do this a third time and then slowly inject the rest of the solution. This technic should be adopted in every case when the treatment is begun and from what has been observed in the Geneva clinics, I would add that it should be the routine practice if accidents are to be avoided.

As you know, Milian introduced the use of adrenalin as a treatment of nitritoid crises and he very rightly objects to its indiscriminate use as a prophylactic, because as no reaction takes place after its administration the practitioner, deceived by this fact, is apt to give a too large dose of the arsenical product so that accidents occur later and then the adrenalin administered may not be effective in counteracting them.

TREATMENT OF LOCOMOTOR ATAXIA.

And now that we have been discussing the question of injection of arsenical preparations, allow me to refer to the treatment of locomotor ataxia at its onset and also to make a few remarks on the proper manner of giving intravenous injections of the arsenical and mercurical products. When the physician detects the very early signs of a commencing tabes dorsalis, the patient presenting pain of the radicular type, ocular disturbances, such as paralysis of the external rectus, unequal and irregular pupils, and paresis of the pupil reflexes to light, vesical and genital disturbances, absence of the osteotendinous reflexes, anal pruritus and Romberg's sign, an extremely energetic antisyphilitic treatment should be begun immediately. For a long time it had been supposed that mercurial treatment was without effect on the evolution of locomotor ataxia and some observers even went so far as to pretend that the treatment might aggravate the disease, but in reality, at present, with the newer therapeutic agents at our command, these conceptions are not only erroneous but are actually dangerous. By taking locomotor ataxia in hand at its onset and attacking the process by energetic treatment, not only can the progress of the disease be controlled, but an amelioration of all the symptoms may be obtained as well, to such an extent in some cases that it is about equal to a cure.

But it must be understood that the ingestion treatment is absolutely without effect, that intramuscular injections can only be a complementary treatment destined to continue the good effects resulting from intravenous injections, and that the only treatment that gives favorable results in the process under consideration is the intravenous method. Unquestionably, this procedure offers some disadvantages, the first of which is that it requires considerable skill on the physician's part, otherwise local accidents arise that are not devoid of gravity. On the other hand, this procedure obliges the patient to make frequent visits to the physician, which is a loss of time and is expensive, since the treatment must be prolonged. It is consequently the duty of the practitioner to make this clear to the patients in the latter's interest.

As has been said, intramuscular injections are absolutely insufficient. Injections of gray oil are useless; those of calomel in oil recommended by Babinsky are very potent, but unfortunately, regardless of the various improvements made in the preparation of this oil, many patients are unable to tolerate it on account of the unbearable pain to which it gives rise, so that its use should be restricted to tabetics with muscular anesthesia. In them it works wonderfully. Finally, injections of biniodide or benzoate of mercury are useless therapeutically. Therefore, the treatment consists of injections of cyanide of mercury and novoarsenobenzol.

The injections of cyanide of mercury should be given in series of fifteen, at the rate of one every second day.

(*To be concluded.*)

Book Reviews

DIET

Right Food the Right Remedy. By Charles C. Froude, B.Sc. With an introduction by Royal S. Copeland, A. M., M.D. New York: Brentano's, 1923.

The subject matter of this book consists of a discussion at length of the subject of diet, principally for the adult, although a small amount of attention is given to the diet during infancy and childhood. It is treated from the viewpoint of a follower of J. H. Tilden, who runs a sanitarium in Denver, Colo., and publishes a magazine called *The Philosophy of Health.* Tilden has built up a large following all over the United States, so that a physician who is practising dietetics can see from the questions of many of his patients that they have been influenced by the Tilden method.

The following points are brought out in this book: 1. The harmful effects of refined sugar and refined cereals. 2. The separation of the concentrated starches from the heavy proteins, not permitting them at the same meal. 3. The separation of the acid fruits from the concentrated starches. 4. The importance of raw foods, such as fruit and green vegetables, eaten as salads. 5. The emphasis upon the alkalinity of these foods and the prevention thereby of acidosis. 6. The prevention of the tendency to overeat. 7. The cure for the latter is the use of one concentrated article of food at a meal.

It would be well for the medical profession to read such a book as this in order to familiarize themselves with a method which has influenced so many people. The book is rather lengthy and too complicated in its lists of foods. The letters of the alphabet are not sufficient in number to list the various classes into which the author divides foods. However, the good points of the book are so many that it is worth reading to obtain them.

DIETETICS

Vorlesungen über Diätbehandlung innerer Krankheiten. Von Prof. Dr. H. Strauss. Berlin: Verlag von S. Karger, 1922.

In this fourth edition on his book on dietetics, Professor Strauss, the well known Berlin clinician, shows how much can be accomplished by diet in the successful treatment of disease. Strauss lays stress on the necessity of sufficient nutrition in diet used over long periods. For short periods of time a deficient diet is permissible, provided it meets the needs of the organism to combat the disease. Artificial foods are not essential under ordinary circumstances. In febrile conditions and in debilitated persons, however, they play an important part. All artificial foods should be palatable.

The book can be recommended.

GALLBLADDER

Chirurgie des Voies Biliaires. By Henri Hartman. Paris: Masson et Cie, 1923.

This volume is a collection of monographs upon the biliary passages. It is by far the most complete and satisfying work on the gallbladder the reviewer has seen. The authors take up thoroughly the gross anatomy of the gallbladder and biliary passages with a most complete bibliography. The article on pathogenesis of gallstones and cholecystitis is a most fascinating article to read told in a delightful style. Like most European articles, however, it does not give sufficient credit to some of our Amercian surgeons. No reference is made in this article to the splendid work of Peyton Rous or Evarts Graham.

The fifth chapter takes up thoroughly the etiology and biology of cholecystitis. There are a number of well reproduced photomicrographs and pictures of gross specimens of cholecystitis with and without stone. The operation is very well discussed with a thorough bibliography and satisfactory illustration. The reviewer thoroughly recommends this work as it is most painstaking and complete.

GALLBLADDER DRAINAGE

Nonsurgical Drainage of the Gall Tract. By B. B. Vincent Lyon, M.D. Philadelphia: Lea & Febiger, 1923.

This book deals with the newer methods of examining the bile directly as it flows into the duodenum. Lyon presents to the medical profession the diagnostic and therapeutic value of nonsurgical drainage of the biliary system. In treating duodenal ulcer by duodenal feeding Lyon drains the gallbladder once a week in order to prevent the bile from becoming static.

Gallbladder drainage is of practical importance in the treatment of early states of biliary stasis and simple catarrhal jaundice. It is useful, first, as a means of diagnosis of biliary diseases; second, as an alternative method of treating many types of gallbladder and duct disease, in which the question of the need of surgery is not yet definitely settled; and third, as a supplementary method of continuing, postoperatively, the surgical principles of drainage in those cases incompletely cured by surgical measures alone.

The book contains numerous valuable points of practical use to the general practitioner and is therefore recommended as a valuable addition to his medical library.

ESSAYS

Outspoken Essays. By William Ralph Inge, C.V.O., D.D., F.B.A. London: Longmans, Green & Co., 1921.

W. R. Inge is Dean of St. Paul's, London. The essays in this volume were written before and during the World War, and were first published individually in prominent British reviews, which doubtless accounts for the considerable amount of repetition in the volume. The various titles are: Our Present Discontents, Patriotism, The Birth Rate, The Future of the English Race, Bishop Gore and the Church of England, Roman Catholic Modernism, Cardinal Newman, St. Paul, Institutionalism and Mysticism, The Indictment Against Christianity, and Survival and Immortality.

The book is much too serious and full of meat for a brief review to be able to do justice to it. It will repay reading by any thinking person interested in the solution of national and world problems that led up to the war—hence, perhaps, that will lead to future wars—and caused by the war. Some of the essays treat religious and ecclesiastical subjects, and the chief impression these make on the mind of the reader is, perhaps, that here at last is a churchman not at variance with the orthodox church, yet who is able to recognize that the socalled conflict between religion and science is a most unnatural warfare, the contradictions of which are intolerable and must be resolved by earnest and openminded thinking. The essays on national and racial subjects indicate that the writer has sound sociological and psychological knowledge for a basis, and, as in the case of the religious discussions, that his attitude of mind is exceptionally liberal and broadminded. Probably the essays of greatest interest to a physician are Patriotism, a study of racial and national differences; The Birth Rate, a survey, historical and statistical of the subject; and The Future of the English Race, in which the author summarizes his conclusions in the sentence: "The nation that first finds a practical reconciliation between science and idealism is likely to take a front place among the nations of the world."

Medicoliterary Notes.

Psychology and Morals is the title of a book by J. A. Hadfield, M. B., lecturer in psychology at King's College, announced for this month by McBride. The author has developed a special psychological method and technic for treating some of the problems of human conduct, which he describes in this volume.

* * *

The Manhattan Trade School for Girls, conducted by the Department of Education of New York City, has created a special branch to be called the Trade Extension Classes, the aim of which is to give individual attention and special instruction to girls who have been unable to adjust themselves to their school work, with a view to discovering the particular line of work for which they are best fitted. The trades taught are household work, sewing, both by hand and by machine, millinery, paste and glue work, laundering and simple processes of the skilled trades.

* * *

Probably the largest mental hygiene meeting ever held was addressed recently in the amphitheatre of the Sorbonne, Paris, by Clifford W. Beers, secretary of the National Committee for Mental Hygiene. . . . Mr. Beers is now in Europe in the interests of an international congress on mental hygiene. Over 3,500 persons heard Mr. Beers's address and 2,000 more were unable to get into the building, according to word that has been received at headquarters.—*Mental Hygiene Bulletin.*

* * *

In spite of the fact that the bubonic plague is always in Java, it causes very little comment among the natives and few precautions are taken to prevent or check it, according to William Ferguson, of Melbourne, Australia, who was recently in New York on his way around the world. "Little Java has a population of 38,000,000. It would be impossible for that enormously fertile island to accommodate such a population if it increased normally. It is kept within limits only by the fact that fifty per cent. of the babies die before they are five years old."—*New York Times.*

* * *

The July *Century* contains several interesting articles on sociological subjects, among them, Four Months in a Model Factory, by Annie Marion MacLean; Southern Prisons, by Frank Tannenbaum; and Prisons and Prison Labor, by Adolph Lewisohn.

* * *

In *Harper's Magazine* for July, Katherine Fuller Gerould discusses modern publicity methods and criticizes them especially for pandering to the public's "inordinate curiosity" about private and personal matters. She blames the papers for ministering to this appetite, even though "they can have been only accessories after the fact." Another interesting article is by Henry C. Emery on the business and commercial morality of the Chinese.

* * *

"Aren't We All?" is a delightful and most refreshing comedy for a hot summer night—or for any time, for that matter. Cyril Maude as the kindly, jolly, but rather rakish Englishman, is almost perfect in his part. And even on the hottest nights, he is graciously willing to add to his labor by very charming and witty little curtain speeches.

* * *

Andrew A. Gour, a Chicago professor of medical gymnastics, has just published a book entitled the *Therapeutics of Activity,* in which he makes an urgent plea for the restoration of the socalled old time dances. He considers them to be activities developing not only the physical and mental sides of the personality, but also the moral, in that they encourage and demand discipline and restraint in contrast to the utter lack of every inhibition demonstrated by so many of the dances of the present day.

* * *

Suggestions for vacation reading among recent works of fiction by popular authors might include *The Garden Party,* by Katherine Mansfield; *Lady Into Fox,* by David Garnett; *A Lost Lady,* by Willa Cather; *The Lengthened Shadow,* by W. J. Locke; *Kai Lung's Golden Hours,* by Ernest Bramah; *The Eighth Wonder, and Other Stories,* by A. S. M. Hutchinson; *Restoration,* by Ethel Sidgwick; *The End of the House of Alard,* by Sheila Kaye-Smith; *Men Like Gods,* by H. G. Wells; *A Son at the Front,* by Edith Wharton; *Raw Material,* by Dorothy Canfield Fisher; *Young Felix,* by Frank Swinnerton; and *The Don Juanes,* by Marcel Prevost. A few of these have not as yet been published, but all are announced as summer books.

Among biographical works that should be of interest to the physician to be available this summer are *Samuel Adams,* by R. V. Harlow, which is described as a psychoanalytical study; *The Story of the Development of a Youth,* by Ernst Haeckel; *Famous Judges and Famous Trials,* by Charles Kingston; *Life of Cesare Borgia,* by Rafael Sabatini; *Life of Pierre and Marie Curie,* by Madame Curie.

* * *

The New Republic for July 25th has an article by Paul Kammerer, the Austrian scientist, now working in England, entitled Inheriting Acquired Characteristics.

Practical Therapeutics

THE TREATMENT OF SENILE PRURITUS ESPECIALLY WITH SILICIC ACID

By Friedrich Luithlen, M. D.,
Vienna, Austria.

In order to carry out a successful treatment of senile pruritus, it is necessary to determine accurately what processes in the general organism and in the skin tissue lead to the symptoms. Various anomalies of metabolism, such as gout, arthritism, diabetes, etc., as well as intoxications from the intestinal tract, may produce pruritus in aged persons. This may also be caused by a hypersensitiveness toward some substances, which are usually introduced with the food; a pruritus may, therefore, also appear as a partial phenomenon of anaphylactic processes in the skin. But if we exclude carefully all the cases in which we can demonstrate external and internal causes as exciting factors, there still remains a group of diseases, in which we attribute the pruritus only to the peculiar condition of the skin and must attribute it to the age of the individual. Only those cases in which there is no external injury, no metabolic disease and no intoxication or hypersensitiveness of the skin should be considered as senile pruritus and only such cases are discussed in this article.

How does it come about that the skin of an individual, which shows no disease, in spite of careful nursing, presents such severe symptoms, apparently without any cause, as are seen in the disease picture of senile pruritus? The etiology of this affection is still uncertain and we are even compelled to draw our conclusions regarding the nature of the processes which occur in the skin, for the most part, from the course of the disease and the results of treatment. In this disease we frequently obtain evidence that the train of thought was the correct one through the effect of our treatment.

The vital activity of the skin, especially its tendency to inflammation, may be influenced by nutrition and intoxications. I have shown previously that changes in the mineral metabolism, namely, slight deviations of the base equivalent balance of the relationship of the individual cations of calcium, magnesium, potassium and sodium to one another, change the biological processes of the tissue. Chemical investigations in connection with the experimental findings in animals presented the evidence that the reaction of the skin is influenced by its chemical structure. At the International Congress of Dermatology in Rome (1912) I lectured upon this subject and proposed to create a physiological chemistry which is to make further advances in this direction. The biological processes of the skin are, therefore, dependent upon their chemistry; this has been proved previously by myself in regard to the mineral metabolism. It is very likely that this statement also holds good for all the other metabolic processes, including also those of internal secretion.

If we wish to establish a therapy in a certain case, we must take into consideration the entire individual, the bearer of this skin; we must determine definitely his general condition and his metabolism, and we must, finally, observe the skin carefully and get an idea of the underlying anatomical conditions.

Take, for example, a case of senile pruritus. We have before us an old individual who presents senile processes in his entire organism, without being able to discover any definite disease which might explain the cause of the itching. The skin itself is flaccid, dry, exfoliating, showing a poor circulation: the anatomical picture corresponds with the clinical picture and shows retrogressive processes of the tissue. The external therapy indicated includes various salves for the dryness of the skin and an attempt should be made to soften the skin and to induce a more vigorous vascularization of the tissue with hot ablutions, sweat baths, sulphur baths and other thermotherapy. The internal therapy should include those remedies which we know lead to a vascularization of the tissue, namely, sulphur, arsenic and iodine. Internal hydrotherapy, such as the intravenous administration of isotonic and hypertonic solutions, which produce a perfusion of the skin and a change in the tissue juice, are frequently given. In a similar way, the methods of colloid therapy, venesection, serum and protein therapy and such injections as lead to disintegrating albumin (turpentine, hypertonic sodium chloride solutions, etc.) also lead to improvement under certain conditions.

We must remember, however, that arsenic and iodine and the colloidal therapeutic remedies lead not only to a change in the circulation of the skin, but also to a vast alteration of the organism and exert a powerful influence upon the relationships of internal secretion. This is very important, as in senile pruritus there is a senile condition of the skin which may be traced to retrogressive processes in the activity of the organ itself and in the function of the other endocrine glands. For this reason we frequently effect cures with organotherapy. We either administer the hormones of the generative glands, the absence of which is apparent in the particular case, or we endeavor to arouse and to regulate the activity of the glands of internal secretion by administering thyroid gland. But at the same time we must not overlook the fact that the skin, *per se*, is an independent organ, to which we must assign its own internal secretion. According to the correlation which exists among all the organs of internal secretion, we can well imagine that the administration of thyroid gland, with its powerful influence upon all endocrine glands, also acts upon the metabolism of the skin, which has also been proved to me by experimental investigations. Therefore, in some cases we are enabled to relieve the itching of senility by influencing the metabolism, especially of the glands of internal secretion and the activity of the skin. Roentgen irradiation might also unfold an effect in this direction.

However, in my practice as a dermatologist, I have seen numerous cases in which no success was achieved with the methods described. It became apparent to me that although we give ample consideration to the general metabolism with the application of these methods, we nevertheless neglect the chemical constitution of the organ and the changes which appear in senescence. As my own experiments have shown, the vital activity of the skin is dependent upon the chemical structure of the tissue and changes with displacements which take place in it.

It has been shown that all the organs of the body become deficient in silicic acid with increasing age (H. Schulz). The reason for this is still undetermined; perhaps the ability of transforming the silicic acid into a soluble, resorbable form is lost in senility. The silicic acid is an important element in the organism; the elasticity and the firmness of the tissues is attributed to their content of silicic acid. As the result of my experiences regarding the importance of an undisturbed balance of the mineral metabolism of the skin, I have come to the conclusion that in the treatment of the senile change of an organ more attention must be paid to its chemical constitution and that a well known error must be corrected in every case. Inasmuch as the oral administration of substances rich in silicic acid did not produce satisfactory results, about six months ago I began with the intravenous silicic acid therapy, after this proved to be harmless in arteriosclerosis, stenocardia and other diseases (L. Scheffler, A. Sartory, P. Pelissier and A. Kühn). I injected natrium silicicum purissimum in one per cent. solution intravenously. I began with 0.5 c.c. as the first injection, repeated this treatment every second to third day and increased it to one c.c., at the most to two c.c. per injection. Up to the present time, I have never given more than a total of 0.1 gram of natrium silicicum in six to ten injections. This treatment is connected with no inconveniences and has proved itself entirely harmless. It is only necessary that the injections be unquestionably made directly into the veins, as the solution produces pains in the tissue. I have seen cures in the short time of a few weeks in numerous cases of senile pruritus, even in those cases in which no success could be achieved with the methods of treatment previously mentioned.

My observations point the way to a new hopeful treatment of senile pruritus; they also indicate that at least a part of the cases of senile itching must be traced to a deficiency of silicic acid, and they show that we must pay more attention to the chemical constitution of the tissues than heretofore in order to achieve complete success with our therapy.

Yeast Therapy and Uric Acid Excretion.—Arthus H. Smith, *et al.*, (*Journal of Laboratory and Clinical Medicine*, May, 1922) reports experiments on four persons who took two, three and five times the commonly recommended therapeutic dose of live baker's yeast, eaten before meals, as recommended in the advertisements. There was no increase in the uric acid excretion following this over the level attained on a low purin diet.

Treatment of Pernicious Anemia.— Louis Henry Hempelmann (*Medical Clinics of North America*, July, 1922) believes that repeated transfusions of blood produce a marked improvement in the condition of the patient and more frequent remissions than any other method of treatment. Splenectomy offers about the same benefits. Focal infections (gallbladder and appendix) should be sought and removed if present. In spite of the more frequent occurrence of reactions with the citrate method of transfusion, it is still the method of choice. If the blood of one donor produces a reaction, another donor should be used the next time and the bloods should be carefully grouped by the method of Moss. The severity of the reaction may be reduced and the reaction may sometimes be prevented by the administration of one quarter grain of morphine with one one hundred and fiftieth grain of atropine during or before the transfusion. The frequency of the transfusion is determined by frequent blood counts and a decided downward trend of the count and also by the subjective feelings of the patient. As many as seventy-four transfusions (about nine gallons of blood) have been given to one patient. The signs of incompatibility of the donor's blood are restlessness, intense backache, vomiting, and collapse after the passage of fifteen to twenty-five c. c. of blood and subsequent hematuria. The transfusion should be stopped immediately with the first untoward symptoms and restoratives should be given at once. The first fifty c. c. of any transfusion should, therefore, be given very slowly. Five to six hundred c. c. of blood may be given at each transfusion.

Blood Serum in Pernicious Anemia.—E. M. Brockbank (*British Medical Journal,* July 22, 1922) states that the serum of pernicious anemia is always definitely yellow and that all other anemias show a nearly colorless serum. The color of the serum can be easily determined by placing two or three drops in a small glass bulb. The serum of pernicious anemia shows the oxyhemoglobin absorption band in the great majority of cases and can be easily seen with a pocket spectroscope; it occurs in no other form of anemia. European observers have found hematin in the serum of some cases of pernicious anemia and they believe that bilirubin gives rise to the yellow color. There may be some free oxyhemoglobin in the plasma of the circulating blood in pernicious anemia. Judging from the serum, there may be at least two varieties of pernicious anemia. The blood platelets are generally very scanty or absent in this disease, but when present, they are a sign of potential regeneration of the red blood cells of the bone marrow.

A remarkable improvement in pernicious anemia generally occurs for a longer or shorter time following the administration of liquor arsenicalis in graduated doses, beginning with four minims three times a day after meals and increasing the dose by one minim every forty-eight hours until doses of eight minims are being taken; the doses are then gradually decreased in the same manner until the original four minims are again being taken. The treatment is then interrupted for a week after forty-eight hours and this course of treatment is repeated for months. Bed rest and fresh air are essential. If cardiac failure is present, 1/240 grain digitoxin is given daily.

Proceedings of Societies

WESTERN SURGICAL ASSOCIATION.

Thirty-Second Annual Meeting, held at Minneapolis, Minnesota, December 8 and 9, 1922.

The President, Dr. Miles F. Porter, of Indianapolis, Ind., in the Chair.

Closure of Chronic Empyema Cavities by the Use of Strong Dakin's Solution and Gentian Violet.—Dr. W. D. Gatch, of Indianapolis, Ind., stated that in seventeen cases of chronic empyema he had succeeded in closing the cavities in fourteen by the use of the socalled chemical method. Two patients had died, but neither from causes in any way connected with the treatment. One patient, with tuberculosis, still had a small sinus, but was able to work and earn a living. The other patients were well, at work, and practically without deformity. The treatment employed had been demonstrated to be devoid of danger, and was easily carried out. The strong Dakin's solution rapidly sterilized the empyema cavity and destroyed its thick wall at a rate which was not too rapid for safety. It also probably opened up pockets of pus not draining freely into the main cavity. Bronchial fistulæ would close practically always when the empyema cavity with which they communicated was completely drained. Cavities infected with tuberculosis could not be irrigated with Dakin's solution unless they had greatly thickened walls. Aqueous solutions of gentian violet could be used to destroy the gram positive organisms in these cavities. Empyema cavities could be sterilized and closed, and would be obliterated after a time. In such cases the thickened pleura would be completely absorbed. Reinfection did not necessarily require the reestablishment of drainage.

Surgical Significance of Mesenteric Lymphadenitis.—Dr. Leonard Freeman, of Denver, Colo., said that mesenteric lymphadenitis was a common disease of children and young adults, which had received too little attention from surgeons. It was characterized by enlargement of numerous lymph nodes, usually small and soft, the infecting agent being, in many instances, the tubercle bacillus, presumably of the bovine type. The most prominent symptoms were: moderate pain, tenderness and rigidity, mostly in the right lower quadrant of the abdomen, often accompanied by slight fever, headache, occasional colic, various gastrointestinal symptoms, and loss of weight and energy. The disease was nearly always confused with appendicitis. Because surgeons were unfamiliar with the trouble, it was seldom recognized during operations. It had a strong tendency toward recovery, at least symptomatically, following laparotomy.

A New Pyeloureteral Plastic Operation for Hydronephrosis.—Dr. Arnold Schwyzer, of St. Paul, Minn., stated that the essential points of the method used in the series of cases reported were: First, the mucosa was not sutured, but brought into exact apposition. This reduced the danger of formation of concretion. In the Fenger operation which followed the pyloroplasty principle, the parts had a great tendency to pucker and separate after the catgut had given away. Unless the two ends of the linear incision remained in good apposition, there occurred a fistula with irregular wound healing. Second, and more important, the slack and fold, which were unavoidably produced by sliding the flap downward to the end of the slit in the ureter, were taken care of at the upper end of the pelvic incisions, and the ureteropelvic junction neither kinked nor puckered.

Two of the cases were closely related in their anatomical pathology, i. e., in the strictured and sharply kinked ureteral opening. Both were combined with a certain degree of infection, the first one showing a large deposit of pus in the urine, the second having considerable rise of temperature. Nevertheless, both patients were now in good health, six and a half and three and a half years after the operation. It was, therefore, permissible to try conservative measures in hydronephrosis, even in the face of a moderate infection, provided this infection had not brought on marked and lasting anatomical changes.

Pneumoventricle Cerebri Following Fracture of the Skull.—Dr. Frank R. Teachenor, of Kansas City, Mo., said that as the presence of air in the cranial cavity or ventricles did not in itself cause any deleterious effects, treatment should be directed against its most common complications: 1, meningitis; 2, intracranial compression; 3, its tendency in intracranial aerocele to the formation of cysts, by replacement of the absorbed air with fluid. Aseptic and antiseptic treatment of the wound was of prime importance. Air in the ventricles was quite rapidly absorbed and in the absence of indication for operative measures for the reduction of intracranial pressure might be ignored. In the cases of intracranial aerocele the air seemed to be absorbed more slowly, and on account of its tendency toward cyst formation, should be aspirated or drained. Drainage would also tend to lessen the danger of meningitis. The drainage or aspiration, if done, should be done early. The accompanying skull fracture and brain injury would usually indicate the type of treatment to be employed. Pneumoventricle cerebri, and especially intracranial aerocele, probably occurred more frequently than the literature indicated.

Endothelioma of the Cheek.—Dr. Edmund A. Babler, of St. Louis, stated that these tumors were very hard to classify, and, in many instances, it was a matter of opinion as to just where they should be placed. They were looked upon by some as intermediate between the sarcomata, lymphangiosarcoma, hemangiosarcomata, and the new growths of epithelial origin. They were all of mesoblastic origin, however, and belonged in the broad group of sarcomata. The case reported exemplified the fact that a fairly large sized tumor of endothelial origin might present itself in the cheek without involving the skin or mucosa of the cheek. The lymph glands of the neck become involved fairly early and quite extensively. The growth became sufficiently large as to interfere with mastication and speech.

Cancer and Benign Growths of the Female Breast.—Dr. Donald Macrae, Jr., of Council Bluffs, Iowa, said that cancer of the breast must be attacked early to insure a reasonable assurance of a cure, but how? He placed himself on record as being against the use of radium, x ray, cancer paste, or any other means except the knife. The earlier the cancer was removed by radical surgery, the greater the hope of permanent cure. Preoperative diagnosis in early cancer of the breast was usually easy. However, one must never be absolutely sure. Gummata were uncommon, but where any question existed, a Wassermann should be taken. Chancre of the nipple must be eliminated as well as tuberculous conditions and lipomata. Retraction of the nipple and glandular involvement were late manifestations, as a rule.

A movable tumor within the mammary gland was probably not malignant. He was not familiar with any other sign or symptom more positive. Surgeons and pathologists should do teamwork on all breast problems. Macroscopic examination after removal in the hands of experienced men was usually followed by a correct diagnosis. However, this examination alone should not satisfy the average surgeon. The experienced pathologist should be on hand to make frozen sections for immediate determination. A good surgeon with a poor pathologist should never attempt removal of questionable neoplasms from the human breast.

Appendicitis; an Analysis.—Dr. Edmund D. Clark, of Indianapolis, Ind., stated that in cases where there was no doubt of the diagnosis an immediate operation should be made. If this rule was followed there would be few deaths, and many of the complications common to the disease would be avoided. He believed that the appendix should be removed in suppurative cases, provided it was easy to locate and deliver. Where much trouble was encountered he drained, and removed the appendix at a later date. In his series he removed the appendix in ninety-two cases and allowed it to remain in thirteen. In all cases of chronic appendicitis where there was suspicion of trouble in the gallbladder, the stomach, or in the kidneys, the incision should be made high and large enough to examine these structures. Where he suspected trouble in the pelvis, he made the incision lower. He always used a right rectus incision. It was his practice to invert the stump of the appendix if there was not too much edema of the cecal wall. If it would not hold a stitch he tied it off and dropped it back into the abdomen. He did not remove the deep tension sutures for eleven days for fear the wound might open under some unusual strain.

Appendicitis in Women.—Dr. A. W. Abbott, of Minneapolis, Minn., said that an investigation was made to see how often pelvic peritonitis existed after appendicitis in women. The study was complex because of the necessity of eliminating all those diseases, operations, and traumatisms that might produce even a mild appendicitis. In over one thousand cases that probably might meet these requirements, only forty-two were found that were absolutely representative. Data were secured as to the relation of appendicitis to pregnancy, in addition to the pathology of the pelvis. Gross and microscopic examinations in all these cases showed the effects of inflammation. Of the forty-two cases, in ninety per cent. there were pelvic adhesions of varying extent. Comparatively little disease was found in the tubes and ovaries beyond adhesions; thirty-five were in married women and seven were single; twenty-three per cent. of the married women had children after appendicitis; seventy-seven per cent. had no children after appendicitis. Of eighteen women fertile before appendicitis, only one became pregnant after; ten had no children either before or after appendicitis; seven had no children before appendicitis, but became pregnant afterward, but these had appendicitis early in childhood.

The Significance of Rightsided Abdominal Pain.—Dr. Robert C. Coffey, of Portland, Ore., said that the chain of pathological conditions that could develop as a result of rightsided ptosis or nonfixation of the right colon might be represented as follows: Nonfixation of the cecum and ascending colon; high fixation of the appendix and its mesentery well up under the liver; fixation of the hepatic flexure to the front surface of the kidney with acquired membranous development to strengthen the support; acquired membranes extending from the parietal peritoneum across to the mobile colon; acquired membranes along the under surface of the first part of the transverse mesocolon, for the extra support of this part of the colon; one band extending along the omentum from the colon to the under surface of the gallbladder, another extending from the colon across the duodenum, making extra fixation; a midline ptosis probably due to dilatation of the stomach secondary to dilatation of the duodenum, which was produced by duodenal arterial mesenteric ileus. These conditions, when taken with the history of the case, made a complete clinical and pathological picture of rightsided ptosis and offered a perfect explanation of the significance of marked rightsided abdominal pain which was not based upon an organic lesion.

Radical Operations on the Stomach.—Dr. William J. Mayo, of Rochester, Minn., after reviewing the various methods of radical operations on the stomach for cancer, with special relation to their applicability in cases of ulcer, discussed partial gastrectomy of the Billroth I type, that is, direct union between the gastric stump and the duodenum, and pointed out that the lesser curvature was the key of the anatomical lock which prevented mobilization of the stomach so necessary for operations of the partial gastrectomy type. He showed that if the gastric artery was tied early and the gastrohepatic omentum was separated from the liver, that by traction on the distal stump of the gastric artery the fat, the glands, and the unyielding structures of the lesser curvature of the stomach could be dissected out, the arteries being tied as they were encountered. This enables the lesser curvature to be elongated remarkably, and in the majority of cases in which the carcinomatous growth or ulcer was situated in the pyloric end or in the lesser curvature distal to the incisura, would permit excision of the diseased portion of the stomach, to be followed by direct union between the stomach and the duodenum. When the cut end of the stomach was more than twice the diameter of the cut end of the duodenum, it should be narrowed by proper suturing of the lesser curvature. The gastroduodenal union was accomplished by taking two stitches on the gastric side to one on the duodenal side, which produced a remarkably smooth anastomosis. Following the gastroduodenal union, the stomach was caught by two catgut sutures placed in the anterior wall sufficiently proximal to the anastomosis, so that when it was attached to the suspensory ligament of the liver it would carry the gastroduodenal anastomosis to the right of the spine, taking the tension from the suture line and improving gastric drainage.

Acute (Puerperal) Inversion of the Uterus.—Dr. Edward Evans, of La Crosse, Wis., said that in the case forming the basis of this paper there had been inversion four hours after manual delivery of the placenta, the patient having been brought to the hospital twenty-eight hours after inversion. On entrance she was anemic, had a temperature of 100.6° rectal, pulse 120. There was complete inversion of the uterus; no cervical ring could be found in the vagina. The uterus was reduced by laparotomy, stretching the cervical ring with the fingers and an assistant inverting the uterus with the hand in the vagina. The patient recovered after a stormy convalescence, during which she had phlebitis in each leg.

Cholecystectomy Without Drainage.—Dr. W. A. Coventry, of Duluth, Minn., said that there were only four deaths in his entire series, and all were drainage cases, but this was largely a coincidence. The first occurred on the third day from a streptococcus infection, proved by autopsy. There was absolutely no leak from the bile passages, nor from the appendix (which was removed at the same time), but it was proved that the infection came from an outside source. Acute dilatation of the stomach occurred forty-eight hours after operation, massive collapse of the lung on the fifth day, and peritonitis and anuria on the eighth day. In practically every case of cholecystectomy one could, if the technic was properly carried out, close the gallbladder incision without drainage. If one did, he felt certain that the postoperative pain, especially passing up into the shoulder blade and scapula, the postoperative nausea and vomiting, postoperative temperature, postoperative tympany, and finally the end result, would be much smoother, more pleasant to the patient and to the surgeon, and far more gratifying in all respects.

Pyelography in Abdominal Diagnosis.—Dr. Daniel N. Eisendrath, of Chicago, spoke of the necessity of a thorough examination of the upper urinary tract in the differential diagnosis of cases presenting symptoms of a subacute or chronic character. Pyelography and ureterography were of greater value than the employment of the shadowgraph catheter alone. In cases where pain was the principal symptom, a pyelogram or ureterogram would at times reveal the presence of changes in the pelvic outline as the result of pyelitis or ureteritis, or of a hydronephrosis or hydroureter due to obstruction, such as kinking from an abnormally movable kidney, calculus, stricture or an abnormal vessel to the lower pole. The differentiation of shadows due to gallstones from those due to renal calculi had been greatly aided by pyelography and a number of slides were shown to illustrate the application of the method.

Perforated Gastric and Duodenal Ulcer.—Dr. A. C. Stokes, of Omaha, Neb., said that the treatment most in vogue was simple closure of the ulcer with gastroenterostomy reserved for pyloric stenosis, perigastric adhesions, and large indurating ulcers. This should be attempted only at the time of the perforation when the patient was in the best of condition, and within twelve hours after the perforation. Simple closure of a perforated gastric or duodenal ulcer cured the ulcer in about eighty per cent. of the cases. The mortality following operation for perforated gastric ulcer increased in direct proportion to the number of hours following the perforation at which the operation was performed. All operations for perforated gastric or duodenal ulcer should be followed by proper medical treatment for considerable periods of time after the operation.

Open Treatment of Apparently Hopeless Cases of Cancer in Conjunction with Radium and X Ray.—Dr. Emil G. Beck, of Chicago, reviewed his work of the past eight years in using this method, which consisted in the removal of all cancerous tissue consistent with safety to the patient's life, leaving the wound widely open and treating the open cancer field with radium and x ray. He reported and demonstrated a number of cases, some belonging to the hundred per cent. mortality group, without recurrence from three to five years.

The essential requirements for successful treatment were: 1. Cooperation with a thoroughly competent radiologist and pathologist. 2. Personal supervision of each case, including the dressings and constant watching of the effects of radioactive substances. He discussed the morphological and biological changes in normal cells and cancer cells after radiation. The factors which determined the tissue changes were: 1. Dose of radium or x ray at source. 2. The distance of the radioactive substance, or the anode from the body. 3. The length of time of exposure. 4. The thickness of the intervening tissues. A small amount of radiation had a tendency to accelerate the growth of tissues, and caused proliferation of the cells. Larger doses would paralyze the reproductive power of the cells, and thus retard or entirely inhibit the growth without actually destroying the life of the cell. Massive doses would destroy the life of the cell. It was disintegrated and the end products were absorbed in the body and eliminated through the excretory organs. This applied to all living cells, but some cells were more resistant than others to radioactive application. The author offered an interesting theory for the radiosensibility of cancer cells. He compared the mass of cancer cells to an alienated, detached, and lawless community of cells which had two functions, nutrition and reproduction. They appropriated nourishment at the expense of the whole human body and grew without definite arrangement of structure in an unorganized manner. They did not give any counterservice in return for the nutriment they received. The cancer cells were detached from the central nervous system and, therefore, injury to them was not under the protection of them; they might be injured more easily by radioactive substances, or any other agent, such as heat or even the actual cautery, than the normal body cells which enjoyed the protection of the organism.

(*To be concluded.*)

Abstracts from Current Literature

CLINICAL MEDICINE.

Sugar Metabolism.—Alfred Gigon (*Schweizerische medizinische Wochenschrift,* December 30, 1922) found that the power of rotation of solutions of glucose that are mixed with ammonium carbonate and ammonium sulphate, ammonium chloride and calcium hydroxide is rapidly reduced. Sugar resorbed in the intestine is demonstrable in the blood only in a low percentage after a few minutes. The author assumes that the greatest part of the sugar is bound by the nitrogenous substances in the blood and that it is not transformed into glycogen during its first passage through the liver, but only after it has circulated through the body and has returned to the liver through the hepatic artery. The blood sugar may be an important factor chiefly in the normal albumin metabolism and the changes in the albumin metabolism may be a criterion of the variations of the blood sugar, as, for example, in the hyperglycemia and in the dextrose test after fasting for twenty-four hours or after work.

Further Clinical Experience With Insulin in Treatment of Diabetes Mellitus.—F. G. Banting, W. R. Campbell and A. A. Fletcher (*British Medical Journal,* January 6, 1923) summarize the results of their investigations as follows: 1. Under treatment with insulin in patients who are not otherwise amenable to treatment: a, glycosuria is abolished; b, ketones disappear from the urine and the blood; c, blood sugar is markedly reduced and maintained at normal levels; d, the alkali reserve and alveolar carbon dioxide of patients in acidosis and coma return to normal; e, the respiratory quotient shows evidence of increased utilization of carbohydrates; f, the cardinal symptoms of diabetes mellitus are relieved and the patients show well marked clinical improvement. 2. Insulin is a specific in the treatment of diabetic coma. 3. Certain procedures are suggested as a guide in the administration of insulin. 4. Hypoglycemic reactions in man have been studied and described. 5. Hypoglycemic reactions following insulin treatment are relieved by the administration of carbohydrates and also by the injection of epinephrine.

In order to determine what patients require insulin treatment and the requisite dose, the following general plan of investigation and treatment was adopted: The history and physical examination of each patient are investigated on admission. Patients admitted in coma or in the precomatous state are given insulin treatment immediately. For other patients, a diet, calculated on the normal basal calory requirement for that particular age, height, weight and sex is given; it should contain sufficient protein to maintain nitrogenous equilibrium and carbohydrates and fats in such proportion as to avoid the excessive formation of ketones. Fasting for a day helps to attain constancy of sugar excretion more rapidly. Patients are kept in bed for a time and then only slight exercise is allowed. Routine blood and urine examinations are done for a week or more. Those cases showing decided glycosuria and hyperglycemia, with possibly various degrees of acidosis, are selected for insulin treatment. With a preparation of insulin known to be potent and to contain about one unit to one c.c. according to the pharmacological assay, an amount is given which is calculated to be somewhat less than that required to render the urine sugar free. Insulin is administered, according to the amount required, in one, two or three doses, at or shortly before meals. Subcutaneous injection is the method of choice. Uranalyses at short intervals determine when the patient becomes sugar free, and the subsequent doses are adjusted to keep the patient in this condition. The food should be prepared in an inviting manner. Complete records should be made of twenty-four-hour specimens of urine, which are to be examined qualitatively and quantitatively for sugar, acetone, diacetic acid, and the total nitrogen and the routine tests for volume, specific gravity, albumin and the character of the sediment should also be made. All patients are benefitted by this treatment.

Glucose Tolerance in Chronic Arthritis and Allied Conditions.—G. L. Kerr Pringle and S. Miller (*Lancet,* January 27, 1923) concludes: 1. That a lowered glucose tolerance is present in a large proportion of cases of arthritis and muscular fibrositis, which lowered tolerance is specially marked in the great majority of the severe infective cases, as well as in the cases of periarticular fibrositis and muscular fibrositis (2). That the degree of intolerance is roughly proportional to the activity of the arthritic process. 3. That the glucose toleration reaction tends to return to normal with convalescence and recovery, which return to normal, in most cases, is most rapid when the infective foci have been removed. 4. That the estimation of glucose tolerance, taken in conjunction with the other clinical signs and symptoms, is of assistance in classification as well as in the prognosis of cases of arthritis. 5. That in cases with a markedly lowered glucose tolerance, and in which the focus of infection can not be found and removed, the prognosis is bad.

Interpretation of Blood Sugar Estimations That Are Near the Normal.—Henry J. John (*Journal of Laboratory and Clinical Medicine,* December, 1922) described six cases in which the blood sugar value was from 123 to 161 mg. to 100 c. c., with glycosuria in one case. In all these patients the blood sugar was near normal, but when a glucose tolerance test was made, a definite diabetic curve was obtained. In discussing these cases the author points out that blood sugar levels which are near the normal should not be interpreted as such until it is known under what conditions the blood was obtained (whether the patient has been on a diet, etc.), and until it has been determined by a glucose tolerance test that the slight rise is of nondiabetic origin. In borderline cases with a diabetic trend a simple restriction of carbohydrates will usually carry the patient comfortably through life, but if the case is allowed to go on without dietary supervision, it will reach the stage when a marked restriction of proteins and total calories as well as carbohydrates is necessary.

Diastase in Blood and Urine in Diabetes Mellitus.—Estimations of diastase simultaneously in blood and urine made by G. A. Harrison and R. D. Lawrence (*British Medical Journal,* February 24, 1923) in fifty-five diabetics and a large number of controls support the theory that the presence of amylase is more or less accidental and of little value in the diagnosis, prognosis, or treatment of diabetes mellitus.

Pancreatic Diabetes in the Dog.—John R. Murlin, Benjamin Kramer and J. E. Sweet (*Journal of Metabolic Research,* July, 1922) report experiments on the administration of pancreatic extracts to depancreatized dogs, done from 1913 to 1916, which supply additional proof of the presence in pancreatic tissue of a substance capable of restoring to the diabetic animal the ability to utilize glucose. This work thus confirms the recently reported studies of Banting and Best.

Influence of Benzyl Benzoate Upon Nitrogenous Metabolism.—George T. Pack and Frank P. Underhill (*Journal of Metabolic Research,* July, 1922) believe as a result of their experimental work on dogs that the therapeutic dose of benzyl benzoate for human beings is probably insufficient to disturb the normal nitrogenous metabolism. Larger doses, above 0.5 c. c. to the kilogram of body weight, cause an increase in protein catabolism in dogs. The titratable acidity and total phosphorus excretion in the urine are augmented, the tital nitrogen output is increased, a marked creatinuria occurs, and conjugated glycuronates appear in the urine. Creatinine metabolism is not modified.

Studies in Carbohydrate Metabolism.—I. Some Comparisons of Blood Sugar Concentrations in Venous Blood and in Finger Blood.—G. L. Foster (*Journal of Biological Chemistry,* February, 1923), compared the concentration of blood sugar in venous blood and in finger blood of healthy students after the ingestion of various sugars, with the following results. In the fasting condition the sugar concentrations of finger blood and venous blood are practically the same. After the ingestion of glucose, the sugar in the finger blood rises to much higher levels than in the venous blood. After fructose the rise in the finger blood is much less than after the ingestion of glucose, while the rise in venous blood is slight and often entirely missing. Galactose showed much higher levels of hyperglycemia and a close correspondence of finger and venous blood throughout the curve. After starch curves like those following glucose were obtained. No change was found after the ingestion of agaragar.

The Action of Phosphoric Acid Ions Upon the Blood and Urine Sugar in Man.—H. Elias and St. Weiss (*Wiener Archiv für Innere Medizin,* April 5, 1922) show that intravenous injections of hypertonic monosodium and bisodium phosphate solutions, with few exceptions, diminish the diabetic and alimentary increased blood sugar, but not the normal blood sugar. Every one of these blood sugar reductions is associated with and followed by a reduction of sugar excretion, if such exists; this reduction of the blood sugar lasts from two to four hours and that of the urine sugar lasts up to three days. The three grades of diabetes can not be differentiated by the injection of phosphates. The action of the phosphates seems to affect the intermediary metabolism directly and the kidneys indirectly. It is associated with the phosphoric acid ion; the alkaline bisodium phosphate is three times as effective as the acid monosodium phosphate. The reduction of the phosphorus content in diabetic serum cannot explain this phenomenon: the phosphorus values in diabetic and normal serum are equal. There is no reason for believing that a formation of dextrose diphosphoric acid is the cause of the reduction of the blood sugar level, nor can an oxidizing glycolysis be demonstrated in blood. The sugar actually disappears from the blood as a result of the action of the phosphoric acid, either by combustion processes otherwise induced, or by the storage of a carbohydrate or a carbohydrate phosphoric acid in the tissues, as explained by the varying permeability of the muscle cell membranes.

Studies of the Slight Glycosurias.—J. E. Holst (*Acta Medica Scandinavica,* November 29, 1922) describes seventeen cases of light glycosuria, that is, glycosuria without diabetic symptoms. In these the amount of blood sugar was measured on an empty stomach, the alimentary variation, and the amount of blood sugar causing glycosuria. Hagedorn's micromethod was used in these experiments and also Hagedorn's technic used for studying the blood sugar curve after ingestion of one grain of glucose in ten grams of water to the kilogram of body weight. The cases were divided into three main groups, the diabetic, the renal, and a transition type, of which seven cases were reported. Besides these there were some cases of temporary glycosuria in which the functional tests gave normal results and in which no metabolic or renal anomalies could be demonstrated. The experiments confirmed the theory that renal glycosurias are of benign character. This was also true of the transition types. The diabetic type of cyclic glycosuria with proper treatment offers a good prognosis. As to whether these cases show a progressive tendency when not treated has not been definitely confirmed.

Use of a High Fat Diet in the Treatment of Diabetes Mellitus.—While the use of fasting and undernutrition has been attended by a great improvement in the treatment of diabetes, especially in its severer forms, L. H. Newburgh (*Medical Clinics of North America,* March, 1923) believes that certain theoretical considerations suggest that moderate restrictions of calories during the period of desugarization will accomplish as much as complete fasting, and that a maintenance diet will be just as capable of keeping the patient sugar free and of preventing or delaying downward progress as will undernutrition. Since fasting and prolonged undernutrition inevitably lead to incapacity, it is eminently worth while to determine by actual trial whether a dietetic regimen that allows sufficient calories to avoid this evil will control the disease itself as effectively as the more rigorous plan. In order to supply more calories without increasing the glucose equivalent of the diet, it is necessary to feed the patient a diet relatively much higher in fat and poorer in protein has been customary in the past. The use of such high fat diets can be justified only when it has been proved that the additional fat does not increase the liability to acidosis. In two hundred consecutive cases of diabetes mellitus the author has been enabled to show that high fat, low protein and low carbohydrate diet not only causes no acidosis, but is even attended by its disappearance in those patients who were suffering from an acidosis at the beginning of treatment.

Further Experiments With High Fat Diets in Diabetes.—Frederic S. Leclercq (*Journal of Metabolic Research,* July, 1922) describes three cases of severe diabetes showing the effect of increasing the diet with fat beyond the caloric tolerance. Such a procedure will cause a rise in the blood sugar, generally slow, but in the severest cases it may be rapid. The cases illustrate the well known fact that in fasting or undernutrition even emaciated patients derive their energy chiefly from body fat. It is the opinion of Leclercq and of the Physiatric Institute that the statement that severe cases of diabetes can be cleared up by high fat diets is contrary to their experience and to fact. The attempt to prevent undernutrition by giving fat or any other kind of food prevents also the benefits of undernutrition.

Glucose Tolerance Test.—Wann Langston (*Journal of Laboratory and Clinical Medicine,* February, 1922) reports a series of 235 observations on 154 patients, fifty-three of whom had proved carcinoma. From these results and a study of the literature he concludes that carbohydrate metabolism is under control of the internal secretion, and is sensitive to changes in endocrine function, and it is also disturbed by carcinomatous growth. Therefore the blood sugar tolerance test should be of value in these conditions, although the test needs further confirmation. While there is no sugar tolerance curve definitely characteristic of carcinoma, in most cases there is a certain type of curve which is found in comparatively few other conditions, including tuberculosis, diabetes mellitus and hyperthyroidism. In suspected carcinoma of the bile tract area complicated by jaundice, the test is of no value.

Blood Picture in Gout; With Some Notes on Tophi.—J. M. H. Munro (*Lancet,* May 13, 1922) found the blood counts strikingly similar in several respects to those obtained in nongouty multiarticular arthritis. The erythrocytes were over and under one hundred per cent. in about equal proportions, but the hemoglobin was deficient in all cases; hemoglobinemia is equally characteristic of gouty and nongouty polyarthritis if chronic. The leucocytosis varies in gout in the course of active joint involvements. Tophi may show either a milky fluid content or chalky concretions, or a sanguineous fluid. Neither will invariably show crystals, nor are the urates invariably crystalline in tophi. The chalky concretions may contain no urates but principally calcium phosphate (wrongly called chalky gout).

Serological Classification of the Staphylococci.—T. G. M. Hine (*Lancet,* December 30, 1922) concludes that there are two main groups of staphylococci: those being pyogenic and almost always forming acid with mannit, and those resembling the socalled Staphylococcus epidermis albus, usually failing to make acid in mannit broth and generally forming white colonies. The first group contains at least three serological types, of which the first type represents 90 per cent. of cases. The second group contains two serological types, the second of which is not so common as the first and appears also to have some pathogenic properties. The agglutination tests of the staphylococci, while affording some indication of serological types, are insufficient without absorption of agglutination tests to determine the serological position of many individuals.

Effects of Various Foods, Food Factors, and Chemical Agents Upon the Resistance of Animals to Acetonitrile.—Masataro Miura (*Journal of Laboratory and Clinical Medicine,* February, 1922) used standardized, synthetic foods, the nutritional significance of every factor of which was known, so that the constituents could be varied at will, while the composition of the food was kept under exact control. The results of this work show that only in the cases of underfeeding, of feeding with iodine as the solid mineral, of feeding with oat starch, and possibly of diets high in fats, was any alteration in the resistance to acetonitrile obtained. It therefore appears that the susceptibility of mice to poisoning with acetonitrile is not easily affected by changes, either of quantity or quality, in the dietary composition, and it is suggested that this may serve to emphasize the factor of safety possessed by the organism in its response to alterations of the diet.

Occurrence of Anemia in Rats on Deficient Diets.—William M. Happ (*Bulletin of the Johns Hopkins Hospital,* May, 1922) found that a diet deficient in iron alone does not produce anemia in the rat in the first generation, nor do diets consisting solely of cow's milk or milk and bread. On these diets slight anemia may occur in rats of the second generation. Diets deficient in an organic substance contained in codliver oil and to a less extent in butter fat, and which also have a low calcium high phosphorus ratio, producing ricketlike changes in the rat, cause anemia in some animals. Those of the second generation may also become anemic on this diet, the anemia being associated with evidences of increased hematopoietic activity, and frequently an enlargement of the spleen, resembling the anemias associated with rickets in human beings. Diets which produce severe rickets with great regularity, those low in the organic substance contained in codliver oil, and low in phosphorus with a normal calcium content, do not cause anemia; nor do diets deficient in fat soluble A or water soluble B, although they cause severe nutritional disturbances. Diets which were so deficient in water soluble B as to produce polyneuritis diminish leucopoietic activity and cause a severe leucopenia, with a shift to the right in the Arneth formula.

A Septic Form of Stomatitis.—Karl Kundratitz (*Wiener klinische Wochenschrift,* July 13, 1922) reports a case of a true primary, membranous stomatitis with septic symptoms in a boy twelve years old. This case closely resembles the disease picture described by Widowitz, with the exception of the absence of the septic exanthem and empyema. The author believes that the absence of these two symptoms is traceable to the greater power of resistance of the older child.

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INFECTIOUS DISEASES.

Etiology of Scarlet Fever.—R. W. Pryer (*Journal of Laboratory and Clinical Medicine,* July, 1922) states that the organism which had previously been reported by him as being found only in scarlet fever shows several varieties. Under certain conditions one of these was somewhat similar in its morphology to Bacillus diphtheriæ and may be a toxin producer. Diphtheria antitoxin protects against this culture, providing the antitoxin is given some time before the injection of the culture. Pryer gives a preliminary report of the results obtained by culturing patients sick with scarlet fever, which he believes justifies the tentative conclusion that this variable organism is the cause of scarlet fever.

Fourth Disease or Para-Scarlet?—K. Simpson (*Lancet,* August 19, 1922) had occasion to observe a series of cases resembling scarlet fever, which occurred in a diphtheria ward. The onset of these cases resembled scarlatina in acuteness, except that vomiting occurred only once coincidently with the onset, which was marked by malaise, headache and slight sore throat, a temperature between 100 and 101° F., and a pulse ranging between 90 and 100 a minute. The headache was a pronounced symptom. The sore throat was not pronounced and felt rather like a dull pain (congestion of the fauces). The adenitis was slight and usually limited to the submaxillary glands. There was no suffusion of the conjunctiva, no stiffness of the neck and no marked adenitis. Coincidently with the onset, the rash appeared during the first day of illness upon the sides of the neck, extending upward toward the cheeks; the circumoral pallor was not noticeable. The rash lasted an average of about twelve hours and was more uniform and erythematous than in scarlatina; punctation was slight. The color of the rash was a bright rosy red. The parts of the body involved were the abdomen, chest and upper extremities, sparing the lower extremities. The tongue was covered with a thick, creamy white fur, which gradually cleaned up but the tongue did not show the typical raspberry stage. Desquamation occurred on the third or fourth day on the lobes of the ears and upper sides of the neck, was of the pinhole type and was confined to these areas; toward the middle of the second week, a scarlatiniform peeling was noted on the hands and feet, but nowhere else. The convalescence was uneventful and showed no complications. The evidence seems to point in favor, not of a separate fourth exanthem, but rather in favor of a mild but distinct type of scarlet fever, mild in form and distinct, in view of the immunity against subsequent infection with scarlet fever.

Intermittent Treatment of Malaria With Quinine.—Karl Glaessner (*Wiener Archiv für Innere Medizin,* October 15, 1922) reports gratifying results in a series of seventy-seven cases of malaria, in which quinine was administered according to the method of Ochsner. The bowel is emptied with thirty grams of castor oil on the night before the treatment is begun and for twelve days all meat is forbidden, only a soft and fluid diet (preferably lactovegetarian) being allowed. On the two days following the purge, the patient is given 0.15 gram quinine by mouth every two hours, day and night, simultaneously with about 0.25 litre of a hot drink. This course of treatment is then followed by an interval of eight days, when the same course of treatment is repeated.

Infectious Mononucleosis (Glandular Fever).—Warfield T. Longcope (*American Journal of the Medical Sciences,* December, 1922) describes ten cases of this disease and discusses its relation to glandular fever. The uniform character, and the association of an enlargement of the lymph nodes with a striking increase of mononuclear cells of abnormal type in the blood serve to differentiate this condition from other acute infectious diseases. It resembles acute leucemia but may be differentiated by many characteristics. It is of short duration and recovery is the rule.

Immunity Studies of Rocky Mountain Spotted Fever.—Hideyo Noguchi (*Journal of Experimental Medicine,* March, 1923) states that the early administration of immune rabbit serum in guineapigs inoculated with the virus of Rocky Mountain Spotted Fever will suppress the infection if it is given within the period of incubation, the effect being proportionately greater the earlier the serum is administered. If it is given after the onset of the disease almost no beneficial effect is observed. In view of the comparative susceptibility of man and the guineapig, Noguchi recommends that in every instance when the bite of a tick gives rise to the suspicion of a possible infection with spotted fever, or when a person accidentally inoculates himself with the virus, about 0.2 c. c. of the serum to the kilo of body weight (or 0.1 c. c. to the pound) be administered immediately, preferably by intravenous injection. For the average adult about sixteen c. c. should be given. The serum is easily produced in rabbits, and probably will remain active for a year or longer at refrigerator temperature.

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The Medical Fakirs of Athens and the Sexual Problems of Babylon in the Days of Herodotus

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When the circus comes to town the impression made on its citizenship is not always confined to the juvenile members of the population, but chiefly on the juvenile minded. The childhood of the race becomes prominent in the throngs that line the route of the procession. We can not but conclude from the study of the pages of history, reinforced by prehistoric evidence, that in the childhood of our civilization this juvenile minded portion of humanity had a wider expansion and received more deeply extended impressions from the innumerable processions, temporal and secular, triumphal and Bacchanal, funereal and supplicatory, patriotic and political, than has been the case for us in the more advanced nations of the earth in many hundred years. This sort of thing is an appeal to the minds of men through the emotions, moved in the crowd as they are and often leading to erroneous and harmful conclusions. It stirs the heart of man as it did that of Xerxes who fell into tears at seeing the mighty host he commanded spread out before his eyes at the Dardanelles, as it is related in the pages of Herodotus (1).

I have elsewhere in this journal (7) made some reference to snake worship at the dawn of medicine. Historically it is curious to see the snake crawling over from Africa and the Asiatic tropics into the beginning of our civilization in Europe. One of the stories (8) of the birth of Apollo surrounds the infant prophet of the soil with a variegated copper colored snake, a monstrous creature, unfamiliar to the inhabitants of Parnassus. The snake charmer and his box of snakes no doubt not only frequented the roads of ancient Greece, but the chariot tracks of the other side of the Ægean. We have some intimation from Herodotus that at times he bore a prominent part in the shows that the Athenian small boy and the rabble beneath the Acropolis gazed upon of old.

"In the Pæanian Deme there was a woman by the name of Phue about six feet high or perhaps a little less and good looking." Peisistratus dressed her up in garments suitable for the occasion and mounted her on a trim wagon and sent heralds before her to announce that Athena was much interested in leading the banished Peisistratus back to Athens. The heralds went ahead crying: "O, Athenians greet with good will Peisistratus whom Athena loves especially of all men to honor and whom she is bringing back to the Acropolis" (2). This must have been about 550 B. C. For a trick upon such worldly wise men as the Athenians Herodotus thinks this the most foolish thing he ever heard of, and fit only to play on the rudest tribes of men, but there was another procession in Herodotus's time in which we are more interested and it would have been a boon for us if he had told us of it, instead of leaving it to the tradition of later writers. How aware he was of the tendency of tradition to err, how wary he was not to put the stamp of his approval on that which did not appeal to his judgment as probable, we gather every now and then from his pages. "The Greeks say,"—"so the priests tell the story,"—"the Argives say this, but the Spartans deny it,"—"they tell it in this wise." These are phrases familiar to the lover of Herodotus. He specifically declares: "I like to tell what is generally said, but I do not care to believe in it all" (3). Yet until archeology of recent years proved him more often right in what he himself observed or stated on his own belief than not, Herodotus was held in contempt for his credulity by rigid historians whose chief asset was skepticism.

It may be that he did not realize how unsophisticated, how nearly barbarous the Athenians were in the time of Peisistratus, as compared with those in the time of Pericles. More than a hundred years separate these eras and Herodotus was perhaps ten years younger than Pericles. We would perhaps be disposed to join in the judgment of Herodotus as to the trick of Peisistratus, except that there have been since his time certain phenomena which dispose us to disbelieve less in the gullibility of men as wise, in citizens as sophisticated as the Athenians. Wisdom was rather cried up in the time of Herodotus and Hippocrates, but common sense and *sophrosyne*

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in Athens did not always rule the roast and it has been somewhat lacking there in our day. Sophocles was more of the age of Pericles, ten years older than Herodotus, and a citizen of Athens which Herodotus was not. It is said, however, that the two were personal friends.

In Sophocles's day, in 421 B. C., the cult of Æsculapius was formally welcomed to Athens and honored with an ode by him, as a priest of a medical cult. If the god himself did not come from Epidaurus in the form of a snake to Athens as he did to Sicyon riding in a wagon driven by a Sicyonian woman (9), the priest of Æsculapius brought snakes along with him and Sophocles entertained him, if not his snakes, at his house. That is the way we would expurgate the story and we find it reasonable, with Miss Harrison (10), to believe some new point of view in medicine was then engrafted on the ideas already existent in the medicine of Athens, but according to the record it was the god Æsculapius that Sophocles received at his house as a guest, and after generations called Sophocles, by that token, "The Receiver." How much of a revolution there was in Athenian medicine it is hard to say, but the Dexion and Amynos of the inscriptions fade out after that date and Æsculapius reigns with his snakes in the temples, but Aristophanes made fun of them. So the procession which carried Æsculapius to Athens did not again throw dust in the eyes of the Athenians as Peisistratus had done, to the wonder of Herodotus.

We can readily believe here in New York, where a new healer lands at the port or comes overland to town every year, not in a procession perhaps, but heralded by the blowing of trumpets in the press, that a fakir with a box full of snakes and another full of medicines he knew how to use came to Athens and was welcomed by the high priests and their congregations. We must think of these things in terms we understand. But since for all we know he was hospitably received by the doctors of Athens, Æsculapius may have been a little late in coming from the east and when he did come and, being immortal or long lived, he was received with cordiality, but he would have been stoned if he had come in the guise of any mortal like Lister or Pasteur. And that is another way of thinking of it in terms we understand. The world is very old and the sun appears to go around it just as it did twenty-five hundred years ago and with the sun all good things, religious and intellectual, come from the east just as they did then. From Thessaly to Athens, from the Asiatic littoral to the European, the torch was passed. We have handed it on to Japan and still the world rolls around just as it did in the time of Hippocrates and Herodotus.

But Herodotus was right, the Athenian Greeks at the height of their culture would not have stood for a woman driving a snake to town in a landaulet, as they are said to have done at Sicyon, though as I have hinted, that legend, if founded on fact, must have been that of some fakir with a box of snakes going from Epidaurus elsewhere to try his luck. We begin to see plenty of them in New York since the Great War has made it the capital of the world. Aristophanes in the Plutus made all sorts of fun of the temple snakes and the people who believed in them. That may be some excuse for thinking it created considerable commotion in town when the person representing Æsculapius, with snakes in his luggage, was welcomed by Sophocles, popular dramatist, great poet, high priest, high in the affections of his countrymen, even if he was a failure in war. But the fun for the Athenians in the snake motif argues that Aristophanes used the joke because it was new—something come to town recently in 421 B. C., like the Volstead act to Broadway. The jokes added to the gaiety of the Athenian populace until they tired of them, but for all that the snakes remained behind in the temples as long as they stood. I believe there is at present as great a dearth of prohibition jokes in our select theatrical circles as of liquor on the Great White Way.

Miss Harrison seems to think there were sacred snakes in Athens before those came from Epidaurus with the priest of Æsculapius, but if the snakes were an old thing in Athens in 421 B. C., Aristophanes would never have raised a laugh at them in the Plutus. As Herodotus suggested then, it did seem ridiculous to dress up a woman known in one of the demes in Athens and bring her to the Acropolis as Athene, for Herodotus had in his mind the Athens of his day, when Aristophanes made the citizens roar with the snake jokes on the stage. The woman as Athene may have been no joke in politics a century or more earlier. They may have had medical snakes then, too, without eliciting a smile from any except the ungodly. It is likely the snakes and the medical virtues in them and the fun to be had out of them lay dormant. Early faith was a somnolence of the mind. There was a flash of it again when Sophocles wrote his ode, Sophocles pious and awe struck and quite as religious as Herodotus, but the populace was different and the playwriter had his chance. It was no sacrilege any longer to make old women on the stage scream when they touched a cold snake in the night gloom of the temple. I do not know what would happen to the writers of some of the sacrilege nowadays if they were moved back a hundred years even into the wicked New York of our great grandfathers.

Herodotus had his credulities, too, but Hippocrates had no use for snakes and he was born at Cos not far from Halicarnassus across the water, when Herodotus was a boy there of ten perhaps. When Hippocrates was about forty years old we were in the age when the Athenians laughed at snakes, but for all that they crawled around the temple wards. Side by side with Hippocratic science bloomed the absurdities and rascalities of medical charlatanry. Is it different in our day? We try to laugh down the various fake "sciences," but do we? Ridicule is considered a mighty weapon, but it is a flash in the pan that neither prevails nor endures in the face of truth or of error when supported by faith and fanaticism. Wit and ridicule are the wisdom of the foolish, sharpedged perhaps but without temper in the blade or weight in the handle. We all draw the line somewhere and Herodotus drew it at the six foot woman of the deme of Pæania as Athene; that was merely silly.

As I have said, I have contributed in these columns something to the general subject of snake worship in connection with the rise of medicine to a science, but I trust it has done no harm to linger and elaborate with some repetition and some extravagance of space the question of the attitude of cultivated Greeks toward it, with the help of Herodotus and Hippocrates, of Sophocles and Aristophanes. I do not know how one is to understand or even get an idea what medicine really was in any age unless we seek it out in the lay writings of men who have made it famous and are to us its noblest representatives. This sort of thing has to be done by approaching it from different angles, just as in a picture gallery one shifts to different positions to get new light on a great painting.

The curious phenomenon of the drift of enlightenment in the world's currents from east to west has attracted the attention of the most casual reader of history. So gradual, so devious, often so hidden, so insidious, is the march of ideas that lie at the bottom of our religion and our philosophy, our medicine, that we often rub our eyes and try to convince ourselves it is an illusion from which we suffer, seeing the sun rise every morning in the east. We are betrayed by a flower of rhetoric, is our constant precautionary thought. Rome and Athens we see invaded by Oriental influence and beyond them to the west Cimmerian darkness. It is astonishing how ignorant the ancient Athenians were even of the western end of the Mediterranean lands. The snakes, as well as Hippocratic medicine, came there from the other continents, it would seem, the good with the bad.

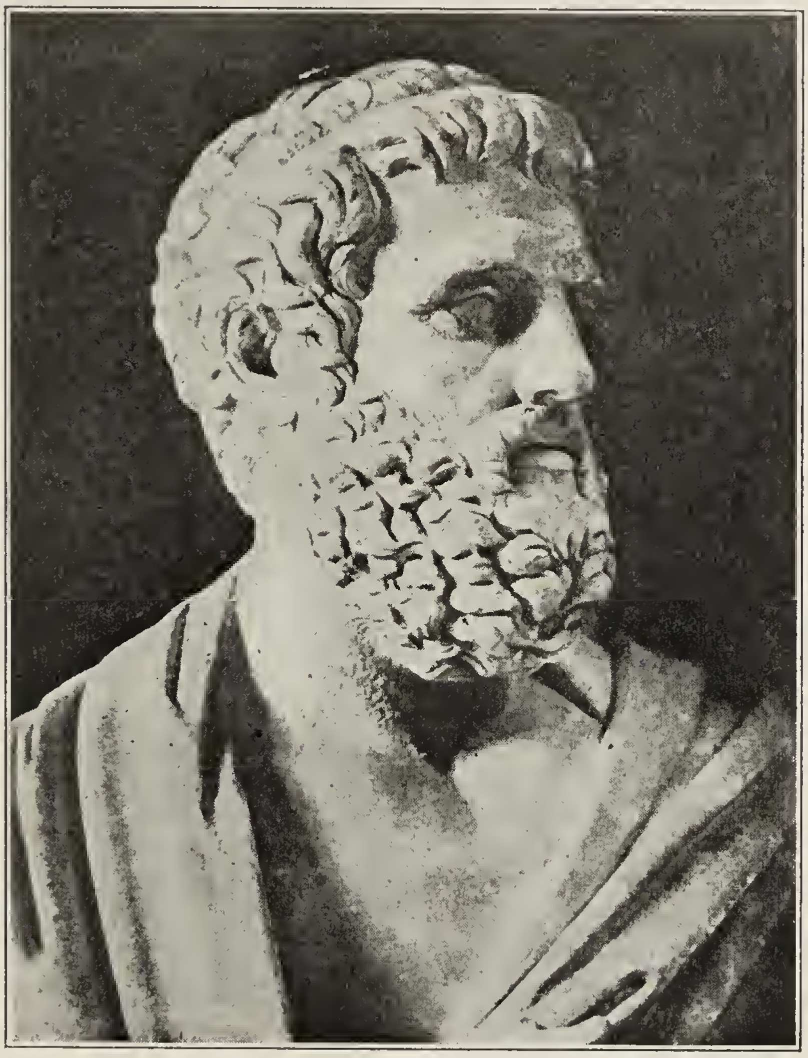

FIG. 1.—Sophocles. (From Greek and Roman Portraits by Anton Hekler.)

The problems of the ancient civilizations have been moved along the roads in the same direction, and we are wrestling with them as they did in Babylon and Susa. Cos less than Cnidus was engulfed in the Persian wave of conquest which swept up to and around the eastern shores of the Middle Sea in the century which produced Pythagoras and Solon and Æschylus. The Persian power enslaved the islands of the coast and profoundly affected their culture, and it may be doubted that it contributed considerable influence to the currents of scientific thought which began to move among the European Greeks, but the Asiatic Greeks, the islanders, became deeply infiltrated through Persian agency, not alone with the lore of Babylon and even of distinct India, but it is probable that through this roundabout channel much of Egyptian learning reached even Athens. As for the Aciatic littoral, it was through Persian imperial commingling of races and ways of thinking and the arteries of travel opened up and the science of Egypt with which it was brought in contact, that it became orientalized after the irruption of northern barbarians on the outlying fringes of Babylonian and Egyptian power, both of them long since beginning to crumble with age. Under the Persian influence, if not its direct domination, arose the Nature Philosophers, Thales, Anaximines, Anaximander, Heraclitus. Now despite the fact that Cos was spared any direct domination or long continued pressure, and was more free from the intimate mingling with Oriental forces brought by Persia to Miletus and even to Herodotus at Halicarnassus, we cannot doubt that where Hippocrates saw the light first, in an epoch when Persian political domination prevailed through the islands, medicine as Hippocrates revealed it to the world derived a not unimportant leaven of learning through Persian channels. The Cnidian sentences, of a supposed origin in Cnidus where Persian rule was harsh, we recognize as more Oriental than other parts of the Hippocratic books, but traces of the lore of Egypt and Babylon are unmistakable elsewhere also.

We get many a hint, often more than a hint—a conviction—from the pages of Herodotus, that Oriental influences profoundly affected, indeed originated, much of Greek thought. We get, in one of his anecdotes, a most dramatic one, a direct indication that Cos was no stranger to Persian tyranny at least. It is the incident of the woman who was a suppliant to Pausanias after his victory at Platæa in 479 B. C., which drove the remnant of Xerxes's mighty expedition out of European Greece.

"When the barbarians were annihilated by the Hellenes at Platæa," says Herodotus (4), "there came then to them a woman fugitive. When she heard the Persian power was destroyed and the Greek triumphant, being a concubine of Pharnadates, a son of Theaspes, a Persian man, she decked herself out with many gold ornaments—both herself and her waiting women and all her following in fine raiment. Alighting from her chariot among the Lacedæmonians, still busy with slaughter, she saw Pausanias directing everything and having been told his name and often having heard of his lineage she accosted Pausanias and clasping his knees she cried: 'O, King of Sparta, save me, a suppliant, from captivity, from the slavery forced on me by the spear, for thou hast prevailed here, thou hast destroyed those who have no reverence for the spirits of the dead nor for the gods. I am of a family in Cos, the daughter of Hegetorides, the son of Antagoras. The Persian has had me, seizing me by violence in Cos.' And thus she was answered: 'Woman, be of good courage, if you are a suppliant and if it turns out you are a daughter of Hegetorides, the Coan, for it happens that he was the greatest friend to me of all those dwelling in those regions.' Speaking thus he turned her over to those of the ephors present and later sent her off to Ægina, where she wished to go." This is a flash from a page of Herodotus but it lights up the text of Hippocrates where the close reader, familiar with the Zend Avesta and the Rig Veda, can not fail to trace the Oriental influences which came through them to the western world when Persians were hunting concubines in Cos.

In this story, besides its mention of Cos we get a glimpse of social conditions in the ancient Oriental empires, which have persisted more or less in the same form to our day. In the war we are waging in medicine on venereal disease we still get nowhere without a careful consideration and a firm facing of the social question where it involves the underlying sexual instincts of men and women by virtue of which the human race persists on this earth. The problem is that they arise to view most obtrusively as unruly passions which threaten social life and all political organization, the sheet anchors of our civilization. It is not a question alone of the cure and prevention of gonorrhea and syphilis. Somehow or other in destroying these we have got to preserve or evolve methods by which sexual desire is both gratified and restrained in a social culture which makes an ever increasing encroachment on the age of the puberty of men and women to prepare them for an ever increasing complexity with which they must struggle for survival and yet exert themselves most efficiently for the good of their race in after life. It is difficult so to compress the ramifications of this vexing problem in the compass of a single sentence as to make it stick in the memory as a coherent conception. Without some unification of an appreciation of the evils of venereal disease with an appreciation of venereal desire as the salvation of man, not as a social animal alone, but as any kind of an animal at all, we are sure to meet with disappointment, even despair, in our efforts to prevent syphilis and gonorrhea.

We do not know how much they suffered from gonorrhea in the old civilizations, not much probably. We do not know that they suffered at all from syphilis, but we do know that family life and the relation of the sexes were on a basis varying in detail very much indeed from our own, yet as we shall see very much like it in some of its forms and rituals. We have applied religion to the question and, of late centuries, a puritanical régime. They both mean sexual continence for the few, how few we do not know, and promiscuity for the many, how many we do not know, but the result has been that while society was thus evolving in western lands, venereal disease has sapped the virility of the race, until we are face to face with the problem in an ever worse form, and the sexual problem in an ever worse form—doubly worse now that we are entering on an era of the social emancipation of women. Must we find vaccines that will render the whole human race immune to syphilis or gonorrhea? That is a purely medical vision. Or must we regulate the relation of the sexes on some better, more liberal basis than has thus far been our ideal, more efficient to preserve the structure of social cooperation, so that progress may be made still further in alleviating the sojourn of men on this earth? That is not a merely social problem. It involves the physiology and psychology of sex. But could there be found any two propositions more chimerical than to answer these questions of despair with an unequivocal affirmative?

Whatever questions we put to ourselves, or whatever answers we make to them, could there be any more foolish way of questioning or a more imbecile way of answering than calmly to disregard the experience of other civilizations so far as it has been possible to present the facts in regard to them? Do we intend to resign ourselves to the ribald recklessness of the jest that syphilization and civilization go hand in hand? When we inquire into the venereal diseases of Babylon and the Nile, even of Rome and Greece, we are met with a shattering of that smart saying, so far as we have been able to ascertain. Certainly gonorrhea was not so rife, if common at all. If syphilis existed, it was in the chrysalis stage, both of them quite incomparably rare when we consider our own plight. I shall not repeat the various references (11) to records which indicate that gonorrhea certainly and syphilis possibly were known of old, but here in passing it may be permissible to refer to the case of Otanes (6), who led the conspiracy which put the great Darius on the Persian throne. This has not been so often adduced. When he was sent to subdue the island of Samos he made a dragnet extirpation of the inhabitants, men, women, and children. What other excesses he committed Herodotus does not tell us, but, "General Otanes helped largely in colonizing it again because of a vision seen in a dream and because of a disease which had seized upon his genitals." Probably it was the same which so plagued the Scythians when they sacked the temple of the goddess at Ascalon, to which Hippocrates also refers (12).

Before Plato dealt with the sexual problem in his Republic we get evidence in the pages of Herodotus that it confronted the civilization of Babylon—long before. The "whore of Babylon" has been held accursed from the time of Calvin to that of DeWitt Tallmadge, but she stands in history as an emblem of that striving after the solution of the problems which confront us today with the added complication of venereal disease, which could hardly have afflicted ancient society as it does us, if at all, so completely has it escaped the records of the past. The Persian practically and openly granted that liberty to man in the higher ranks which man has ever in our own civilization taken secretly to himself. Liberty was the license which consisted for one thing in unrestrained indulgence in sexual intercourse, early and multiple marriages, and numerous concubines. We are told the modern Oriental finds a female bed mate for his son as he rises into adolescence, perhaps in some negro slave woman. This solution of the problem we find traces of as invading Europe, from Asia and Africa perhaps, but it was never confined there.

In an especially stupid play, *The Asinaria,* which Plautus avowed he had from the Greek Demophilus, we get a particularly revolting mark of it, intended to be funny. We note with less repugnance but with some aversion the indulgent view of Goethe's mother as to his bed mate, the pitiable Christiane, whom he even finally married, an action due to that pressure of social justice which was beginning to make itself felt even at the courts of German princelings in the dawn of the nineteenth century. We hear occasionally even now, or perhaps it is better to say one or two generations ago, of mothers on both sides of the Rhine arranging for the mistresses of their sons. In the emancipation of woman, upon the era of which we are fully launched, is this to be endured or swept away? It is sure to become much more frequent, or else to be cast out as anathema. The abortive, noxious if you will, sprouts of this code of morality, or immorality if you insist, have sprung up at the very foundation stones of even our civilization. Stripping ourselves of our prudery or intolerance, if we must, we still fail to see how such arrangements are to fit in with the justice for the woman which her fellow women will surely insist on. It is evident that with the triumph of democracy and the triumph of woman and of many other things which war, "the father of all things," has brought to our doors, that we are on the eve of a radical change in the matter of sexual relations in our social fabric, but just what it is going to be, nobody but a prophet or his ass will venture to say. Surely neither the aristocrats with their concubines, nor the rich with their divorce courts, are longer going to enjoy a freedom from trammels laid upon our social system which bind only the poor and the virtuous and oppress with a stigma and suffering only the female. After all, licentiousness is a thing which grows with indulgence. Individual selfcontrol must in the end save us from mere promiscuity. But at what stage before that? That is the question. To suppose in the present state of political enlightenment that fornication and intoxication are to be the privilege only of the rich is a silliness that is astounding. A great exponent of democracy made the declaration to another generation at the approach of a great crisis that the state could not continue to exist, half free and half slave, and the supposition of only half revelling in wine and women approaches the ridiculous.

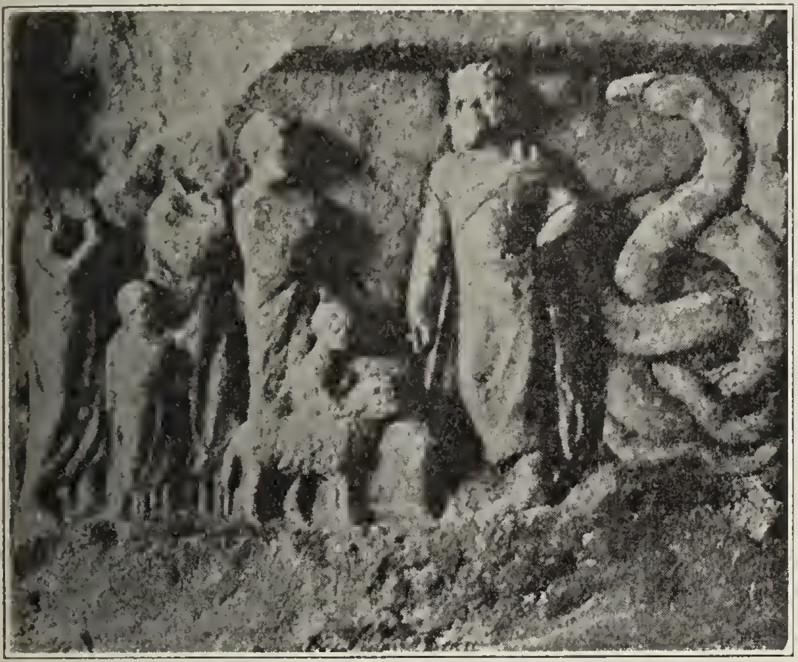

Fig. 2.—The snakes of Athens before Hippocrates.

These then are the considerations that cluster around the medical man's problem of eradicating sexual disease. This struggle with the problem of venereal disease by modern medical science, like every other struggle toward the light, needs the aid of historical perspective and as we look back along the track we have travelled since the time of Herodotus we find the path bristling with difficulties, and much the same difficulties, which are confronting us. At every crisis in social and political history we find sexual passions breaking over crumbling barriers into the light of day.

All these are fairly familiar to us in history, as is the system of concubinage which has prevailed more or less openly at all times in the past history of our own civilization in some form or other, but as to the "whore of Babylon" there are some peculiarities in the tale Herodotus tells of the hierodules of Babylon. There are other instances of sexual intercourse as a part of religious rites, but I am not familiar with any other we know about in a civilization which had reached such a height. What I wish to draw attention to is the part that it played in religion, all powerful in a state which was face to face with the regulation of sexual relations and whose legal codes were so strict, which was so resolute in keeping social order and in dealing out social justice, in a state the political evolution of which was so complex. It was in reality a license of prostitution by a theocracy determined to hold together an oriental political organization and it was doing it by an attempt to satisfy the natural instincts of man. Modern governments in large cities have attempted it without the aid, indeed with the open hostility, of religion.

Aside from the open concubinage on the part of the rich, which differs from our own largely in being open, in essentials the access of the male to the female under the sanction of law and custom was not radically different from our own, except, as with the concubinage, in being more open in the practice of its principles. Herodotus alludes (5) to the slave markets, but closely resembling these were the auctions of marriageable girls in the villages of the people themselves. He says it prevailed in Babylonia and among the Veneti (?) of Illyria. The highest bidder got the handsomest wench. With this we are familiar enough in its less frank form among us.

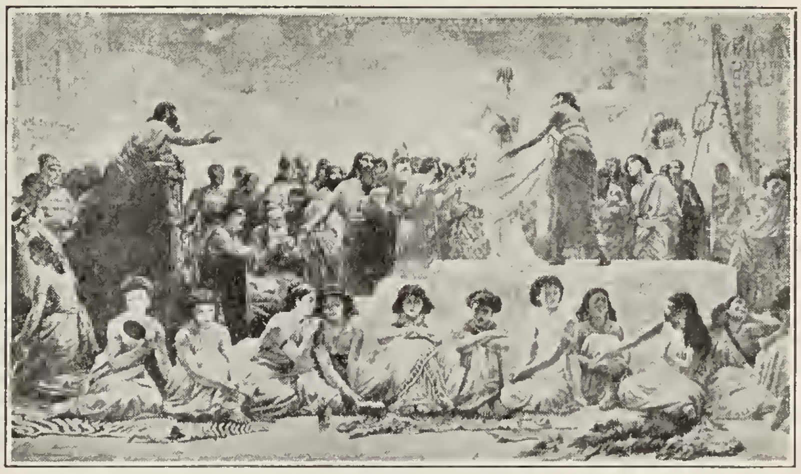

Fig. 3.—The Babylonian marriage market.

The charms of some of the girls brought a very low price. The money acquired from the sale of beauty was used to influence the acceptance of those without such charms. The dower of the bride in many countries of Europe is subventioned by private charity and in some it has been proposed to make it a state institution. Something of the kind probably could be done to establish early marriages and it might be a step in the rational campaign against venereal disease. It certainly is preferable to "birth control." The account of Herodotus runs: "A father was not allowed to give his daughter in marriage to whom he pleased, neither might a purchaser carry off a maiden without security, but he was first obliged to give security that he would certainly marry her. A law was enacted that if they did not agree the money should be repaid." We see this was, in form at least, a very much more insistent intrusion on the part of the state than our own could at present undertake, but it did not differ in principle. The bridegroom bought his bride not from her family but from the state and the state could presumably reimburse in part the family, but what is more to our purpose it could thereby supervise eugenic matings, promote early marriage and make its covenants more widespread among the plain as well as the fair young women. Today such an arrangement could still more efficiently supervise the detection and root out the existence of venereal disease. I am sure that this would appeal to some vexed and despairing social workers as an unattainable but a devoutly to be wished for consummation of a praiseworthy ideal.

But there is a fly in the amber. It is the hierodule, which I am afraid we must accept as a hint that all was not well with the sexual problem in Babylon. Every marriageable woman, high or low, rich or poor, must sit in the temple once in her life, until some male saunterer in its cool precincts should drop a coin in her lap and she must submit to his embraces. This evidently was the "whore of Babylon," which served as a missile for disputatious theologians to hurl at one another long ago, but for us she is the symbol of a further attempt on the part of an hierarchical state to facilitate and regulate and supervise the congress of the sexes. It was a holy sacrament outside of our holy sacrament of marriage and repugnant in the last degree to our ideas. Moreover, we can not fail to see that then as now the barter and sale of brides, even when in the hands of the state instead of in those of the family, was insufficient to regulate the relation of the sexes. The institution of hierodules was an appendix in Babylon to the barter and sale of brides, but the latter does not appear to us, for certain reasons (can it be because we are used to it?) half so horrid as the former. In fact the whole question is revolting to our moral sense, but I fear that our moral sense is subject to distortion and if we are going to deal efficiently with venereal disease it behooves us to get some of the twists out of it, for venereal disease is a worse horror than anything else that ever befell mankind.

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The Results Obtained by Various Methods in the Treatment of Tumors of the Bladder*

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The surgery of vesical tumors has been the subject of much discussion and during the past ten years many new procedures have been advocated. In 1915 Gardner analyzed 666 cases of bladder tumor, in which operation was performed by various surgeons, and found that in 224 cases of resection recurrence developed in 43.7 per cent., in 442 cases of excision of the growth only, recurrence occurred in 88 per cent. When we realize that many of the tumors are benign we see how unsatisfactory the methods are.

In a careful statistical study of 202 cases of vesical neoplasms, operated in during a period of ten years ending in 1919, Judd and Sistrunk (1) have given us a fair presentation of what may be generally expected from modern surgical methods. The hospital mortality was 12.9 per cent. and within two years after the operation 58.4 per cent. of the patients were dead. Of the sixty-four patients who were alive only fourteen had gone more than five years since operation, so that good results lasting for a period of five years were obtained in less than seven per cent. of the cases. The methods employed and the immediate hospital mortality were as follows:

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*From the Brady Urological Institute, Johns Hopkins Hospital. Read before the New York Academy of Medicine, November 16, 1922 (by invitation).

Resection of tumor, with an area of entire bladder wall, 102 cases, deaths in hospital 15.9 per cent.
Excision of tumor and adjacent tissues, sixty-six cases, deaths in hospital nine per cent.
Transplantations of ureter in connection with resection, thirty-six cases, deaths in hospital twenty-two per cent.

Cases treated by fulguration and by radium are not included, so that Judd and Sistrunk's report may be taken as an example of what may be expected by radical surgery at its best.

Barringer (2), in 1921, presents the results obtained by him in the use of radium. Summarizing his cases we find that in twenty-nine cases of carcinomatous tumor of the bladder treated by radium introduced through a suprapubic wound, seven patients were examined subsequently cystoscopically and found to be well, and one wrote that he was well—total patients well, twenty-seven per cent. But a very short period, varying from two to twenty months, had elapsed since operation. Eleven cases, all but one of which were diagnosed microscopically by Dr. Ewing to be carcinoma, and seven of which were large, extensive or multiple, were cured by the use of radium introduced cystoscopically. Three of these had been followed for four years (twenty-seven per cent.) and only three less than one year, so that a hopeful picture is presented of the results with radium.

In a more recent paper Barringer (3) reports cases and more detailed analysis of the results obtained in cancer of the bladder. The reports show most remarkable results. In nine operative cases, which were treated by intravesical implantations of radium, all the patients but one were cured. In twenty-one cases of inoperable carcinoma of the bladder, which were treated by implantations of radium through suprapubic wound, the tumor was removed from the bladder in all cases but in three recurred. One patient died from radium slough of the bladder, and in one of these three the recurrence was beyond the bladder. These statistics are certainly the best that have yet been obtained in extensive and socalled inoperable cancer of the bladder.

It is thus seen that there is much question as to what is the best method of treating tumors of the bladder and as I have been asked to present a paper on the results obtained by various methods in tumors of the bladder, I have seized the opportunity to collect all our cases at the Brady Institute and to study as thoroughly as possible the ultimate results. (Some of the cases are my own, but the majority were treated by my associates Dr. Geraghty, Dr. Frontz, and Dr. Colston, to whom I am very grateful for the privilege to use their private cases, and for much enlightening assistance and advice. *H. H. Y.*)

I. SUPRAPUBIC CYSTOSTOMY.

This has been used in extensive and supposedly inoperable cases; was very frequently employed at one time and now is rarely used except in conjunction with radium which will be considered later. I shall not take time to analyze the results of suprapubic drainage, which is manifestly only a palliative procedure.

II. EXCISION OF THE TUMOR WITH AREA OF HEALTHY MUCOUS MEMBRANE OR PEDICLE.

I find twenty-eight cases in this class, in nearly all of which the tumor was clamped across the pedicle, traction made, elongating the pedicle and drawing up the adjacent vesical mucosa which was then excised with a cautery well away from the tumor. In most cases this seemed a quite radical removal of the papillary tumor, but poor results were obtained. Recurrences occurred in all but three of these twenty-eight cases, and the time elapsed since operation was under one year in two of the cases (both papillary carcinoma) and one five years. Three patients have not replied to letters; three have died, cause unknown; sixteen have died of recurrence (eleven within two years of operation).

To summarize: In only eleven per cent. of these cases may a cure be possible, and the present ultimate mortality is already sixty-eight per cent. Among these were three cases, apparently benign papilloma, removed with great care with a healthy area of mucous membrane, all of which recurred "malignant" and the patients died after subsequent operations. The twenty-eight cases in this group, all of which were thought to be favorable for complete removal by the operation performed, furnish a positive demonstration of the futility of this technic, and bespeak either more radical resection of the bladder or the use of radium or fulguration.

III. DESTRUCTION OF TUMOR AND INFILTRATED AREA OF BLADDER WALL WITH CAUTERY.

There are fourteen cases belonging to this category. All were malignant, usually with extensive infiltration of the bladder wall, and most of them were too extensive or too apparently hopeless to consider resection. Of these fourteen patients, nine have died of cancer. Two are alive, apparently doing well after operation four and eight months ago—too recent to speak of as ultimate results. There remain three cases in which remarkable results have been obtained, as follows:

CASE I.—No. 7138. The patient, aged forty-eight, with a large infiltrating carcinoma on the right side of trigone, involving the prostatic orifice, was operated upon in September, 1918. A suprapubic cystotomy was performed, with removal of papillomatous portion with cautery, deep cauterization of base and adjacent bladder wall and prostate. Recurrence took place one year later; operation was repeated, and the tumor cauterized thoroughly. Cystoscopy was performed on August 13, 1920, bladder was clean, and there was no evidence of cancer (duration two years).

CASE II.—No. 7502, papillary carcinoma three by four cm. in diameter on left lateral wall; suprapubic destruction of tumor with deep cauterization of base and adjacent bladder wall. Examination ten months later showed no recurrence.

CASE III.—J. F., aged fifty; infiltrating papillary carcinoma; suprapubic cauterization of tumor and base. Small recurrence destroyed by fulguration. Examined September, 1920, no recurrence (nine years since cautery operation).

These cases show that exceptionally good results may be obtained by deep destruction of infiltrating tumors with the red hot cautery, either Paquelin or electric. The same effects may be obtained by the cold cautery if deep penetration and destruction of adjacent bladder wall and vesical orifice and prostate (if involved) is obtained. In fact, far more can thus be accomplished than by resection in tumors involving the vesical neck and prostate. One patient died of streptococcus infection following suprapubic cauterization of a bladder cancer—the only operative death: operative mortality seven per cent. Two cases should be cited here.

CASE IV.—No. 2216. The patient, aged thirty-five years, had perhaps a hundred papillomata, mostly minute, scattered all over the bladder but several of moderate size. The bladder was opened with care not to infect prevesical tissues, the tumors completely destroyed with the electrocautery, the bladder treated with twenty per cent. resorcin and closed. Several years later small recurrences occurred, but were cured by fulguration, and on two examinations ten and thirteen years later the bladder was found well on cystoscopy.

CASE V.—No. 2286. The patient had enlarged prostate and vesical tumor, had been treated elsewhere by repeated x ray therapy through the perineum. The cystoscope showed a large round necrotic tumor on the right side of the trigone, and at suprapubic operation it was found to be about two inches in diameter and so necrotic that it was scooped out with ease, having a rough base which was deeply cauterized with the Paquelin. Perineal prostatectomy was also done. Two years later the patient reported himself quite well. The microscopic diagnosis was malignant papilloma.

This apparently remarkable result of the x ray in causing almost complete necrosis of a large papilloma is unique. Both of these cases show the value of cautery destruction of tumor bases. Compared with mere excision of the tumor and pedicle with cautery, even in the apparently favorable and supposedly benign cases in which that was used, as shown in section I, deep cauterization is shown to be of far greater value, and is particularly valuable in infiltrating tumors, especially around the vesical orifice and trigone. It remains to be seen whether radium applications or suprapubic implantation of emanations can give better results. Much more detailed study of such cases, over a period of years, is required, and detailed statistics on these questions should be given by the great clinics.

IV. RESECTION OF BLADDER WITH TUMOR.

There are fifty-one cases in this group in which a radical attempt was made to remove not only the tumor but also a wide area of surrounding bladder wall. These cases have been analyzed as follows: Ages thirty to thirty-nine, two; forty to forty-nine, seven; fifty to fifty-nine, sixteen; sixty to sixty-nine, twenty; seventy to seventy-nine, five; not given, one; total, fifty-one.

Previous operation: Suprapubic excision, four; removal with cystoscopic rongeur, one; radium applied with Young's cystoscopic applicator, two; massive radium treatment through abdomen, one; deep x ray therapy, one. The tumor was single in forty-eight cases and multiple in three cases. In six cases the area of resection included the lower end of one ureter. The results have been tabulated according to pathological diagnosis. (Table 1.)

The recent introduction of radium has been followed by so many surprising, and occasionally amazing results, that we cannot now say definitely how much radical resection of vesical tumors of malignant type—particularly the infiltrating type—should be given up for radium or deep cauterization or both combined. Several years more of experience with radium and careful study of cases will be required before we shall be prepared to give up wholly resecting as radically as possible in apparently favorable cases of carcinoma. An interesting case was one of carcinoma of the posterior wall of the bladder in which, on opening the abdomen, we found the cecum adherent to the bladder. Investigation finally revealed a carcinoma of the appendix which involved the bladder, a wide anastomosis (?) of which was made along with a resection of the lower portion of the ascending colon and cecum, and a part of the ileum. Anastomosis of ileum to colon was carried out by Dr. Mont Reid while we repaired the vesical defect. The patient has had an excellent result—cystoscopy showing no recurrence after two and a half years.

TABLE I.

Fifty-one cases of bladder tumor treated by resection of bladder wall

Number	Patients alive and well less	1 yr.	2	3	4	5	6	7	8	9	10	Recurred No.	Per Cent.	Well over 5 yrs. No.	Per Cent.
36, carcinoma infiltrating	7	1				2	4	1		1	2	13	36	10	29
10, papillary carcinoma.	3	1			1		1					4	40	1	10
3, malignant papilloma.								2				0	0	2	67
1, adenocarcinoma.....												1	100		
1, sarcoma...........											1			1	100
51, malignant tumors...	11	2			1	2	5	3		1	3	18	35	14	27
6, transplanted ureter.	1	1				2	2					0	0		

		Per Cent.
Death due to recurrence........................	11	22
Death due to unknown cause..................	6	12
Alive, tumor recurrent..........................	3	6
Death following operation.....................	3	6
Alive and well last report.....................	28	55
Well, 5 years or over...........................	14	27

V. THIRTY-SEVEN CASES TREATED BY FULGURATION THROUGH CYSTOSCOPE.

This group comprises only those cases in which the treatment adopted was cystoscopic fulguration (without raduim).

MALE PATIENTS.

Ages:

15 years	1	papilloma,	0	carcinoma
20-29 years	3	papilloma,	0	carcinoma
30-39 years	5	papilloma,	0	carcinoma
40-49 years	6	papilloma,	3	carcinoma
50-59 years	5	papilloma,	2	carcinoma
60-69 years	5	papilloma,	1	carcinoma
70-79 years	1	papilloma,	1	carcinoma
Not stated	1	papilloma,	0	carcinoma
Total	27		7	

FEMALE PATIENTS.

Age 71, 1 carcinoma
Age 45, 1 papilloma
Age not stated, 1 benign papilloma

TABLE II.

Thirty-seven cases bladder tumor treated by fulguration only

Pathology: Papilloma	27	Infiltrating carcinoma	4
Malignant papilloma	2	Diagnosis	1
Papillary carcinoma	3	Single 22; multiple 9; extensive 6.	

	No.	less	1 yr.	2	3	4	5	6	7	8	10	?
Alive and well, time stated......	19	3	1		1	4	3	3		1	1	2
Tumor destroyed—pt. not fol.....	1											
Patient alive—recurrence.........	0											
Patient dead—recurrence	8	1	1	1	1	1						4
Benign Papilloma Cases—27												
Pt. alive—no recurrence.........	15	4		1	1	2	2	3		1	1	
Tumor destroyed—pt. lost sight of	6											
Pt. dead—recurrence (cancer)....	1											
Pt. dead—"other cause".........	3											
Pt. dead—cause unknown........	2											

Four patients with infiltrating carcinoma showed no improvement under fulguration; two are known to be dead of cancer, and two have been lost sight of. Likewise, three patients with papillary carcinoma showed little improvement from fulguration and all these are now dead. In two cases, diagnosed malignant papilloma, the tumors were destroyed by fulguration and in one the patient is well now five years later. The other patient has been lost sight of.

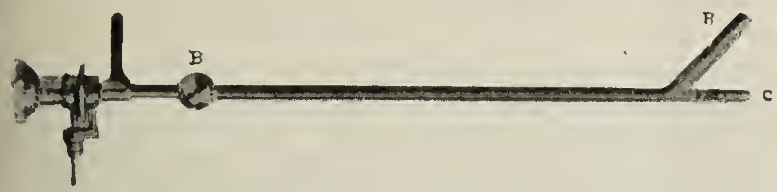

Fig. 1.—Young's cystoscopic radium applicator with ball; b, externally for attaching fixation clamp; c, cystoscope; r, radium in platinum tube.

Summarizing the whole group of thirty-seven cases we see that fulguration has been valuable only in papilloma, both benign and malignant. For papillary and infiltrating carcinoma it has been worse than useless, as some of these patients might have been cured by timely resection, by deep cauterization, by radium, or by a combination of these procedures.

The results shown above in benign papillomata demonstrate the great value of fulguration in this class of tumors. The results are much better than those obtained by suprapubic excision with cautery, and when recurrences have occurred they were readily treated by additional fulguration, whereas after suprapubic excisions the recurrences have been more extensive and sometimes prevesical and very malignant.

Among the twenty-seven cases of benign papilloma the hospital records show that in all cases the tumors were completely destroyed by fulguration so that the immediate results were good. In fifteen cases the patients are reported well, as tabulated above, and three cases not heard from recently were well over two years. Three patients in whom the tumors had been completely destroyed died, respectively, of pneumonia, prostatectomy and accident. We have, therefore, twenty cases apparently cured, or seventy-four per cent. Some of these patients have not been cystoscoped recently so that this figure is probably too high.

VI. 103 CASES TREATED BY RADIUM AND FULGURATION THROUGH CYSTOSCOPE.

In 1914, following Pasteau's publication of three cases of cancer of the prostate and bladder treated by radium introduced through a catheter, one of us devised an operating cystoscope for the accurate treatment of bladder tumors with radium, and in May, 1915, presented to the American Urological Association three instruments for placing radium in different portions of the bladder, each to be used with a cystoscopic clamp, by means of which the instrument was held fast to the table and the radium thus kept at the desired place on the tumor (Figs. 1, 2, and 3). The originality consisted not only in applicators operating around a straight cystoscope by means of which the radium could be accurately placed, but particularly the use of the fixation apparatus. During the past nine years these instruments have been in almost daily use and we are now in a position to determine their clinical value; firstly, by a study of 103 cases in which radium, thus introduced, has formed the main attack upon bladder tumors. All of these cases have also had one or more fulgurations, as it was soon discovered that the combination worked better in almost all cases than either alone. It has been proved that large papillomata, particularly of the malignant type, respond much more rapidly after application of radium when subsequently fulgurated, as previously reported by Dr. J. T. Geraghty.

The technic employed has been to apply a tube of one hundred mg. of radium, by means of the appropriate instrument, every day or two, to a different portion of the tumor, for a period of one hour, during which time it was held in place by the fixation clamp fastened to the table (Figs. 4 and 5). After several radium treatments, fulguration was given intermittently with the radium, in large tumors each being used eight or ten times, and the radium occasionally afterwards (as much as 1,700 milligram hours). The analysis of these cases is as follows:

TABLE III.

103 *Cases treated by radium and fulguration through cystoscope*

Ages of patients	male	female
20 to 29 years	1	
30 " 39 "	6	
40 " 49 "	24	
50 " 59 "	25	3
60 " 69 "	22	3
70 " 79 "	9	2
80 " 89 "	1	
not given	7	
Total	95	8

CYSTOSCOPIC DIAGNOSIS.

Papilloma	25	Over right ureter	14
Papilloma, recurring as carcinoma	3	Over left ureter	22
Malignant papilloma	39	On trigone	20
Papillary carcinoma	20	Behind trigone	14
Infiltrating carcinoma	15	Vesical neck	25
Indefinite diagnosis	3	Lateral walls	35
Single tumor	66	Anterior wall	15
Multiple tumors	32	Posterior wall	1
Extensive	5	Vertex	0

Result	Time Followed										Per
	less	1 yr.	2	3	4	5	6	7	?	Total	Cent.
Alive and well	11	4	5	6	1	4	2	5	8	46	46
Dead—no recurrence	2	1	1		1	1			4	10	10
Tumor destroyed..pt. not fol...										5	5
Later suprapubic operation										2	2
Patient alive—recurrence	8	3	5	1	1	1			4	22	22
Patient dead—recurrence	7	1	3	1					3	15	15

RÉSUMÉ OF 103 CASES.

25 diagnosed benign papilloma, 78 malignant.
Good result, 60 per cent; poor result, 34 per cent; doubtful, 5 per cent.
Among 58 malignant cases, 46 were fairly hopeful cases.
Result: 36 successes, 75 per cent.; 10 large infiltrating carcinomas, all failures; 7 extensive papillary cancer, all failures; benign papillomata 25, cured 23, followed 1 to 7 years.

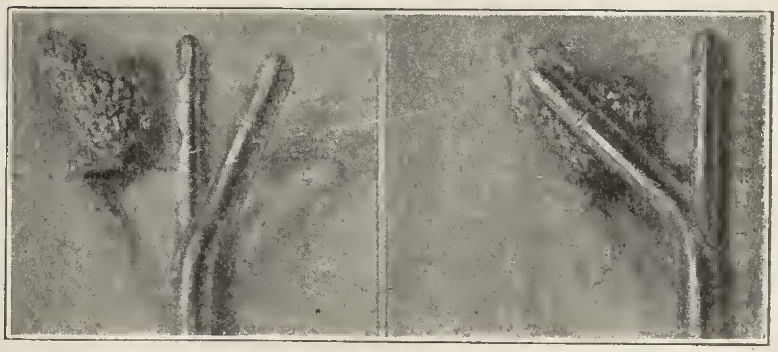

Fig. 2.—Showing the steps in the application of radium to a malignant papilloma in the region of the right ureteral orifice.

As seen in the tabulation given above the benign papillomata, although many were multiple and several very large, have almost invariably been destroyed and ultimately cured. Several of these tumors in which fulguration had been tried without effect, disappeared very quickly when radium was applied several times (500 to 800 MH) followed by fulguration—which is undoubtedly a valuable adjunct to the radium. The results in some of these cases is indeed brilliant. The effects of the treatment is far less constant in the malignant cases as shown by the following tabulated study of cases in which satisfactory notes are present:

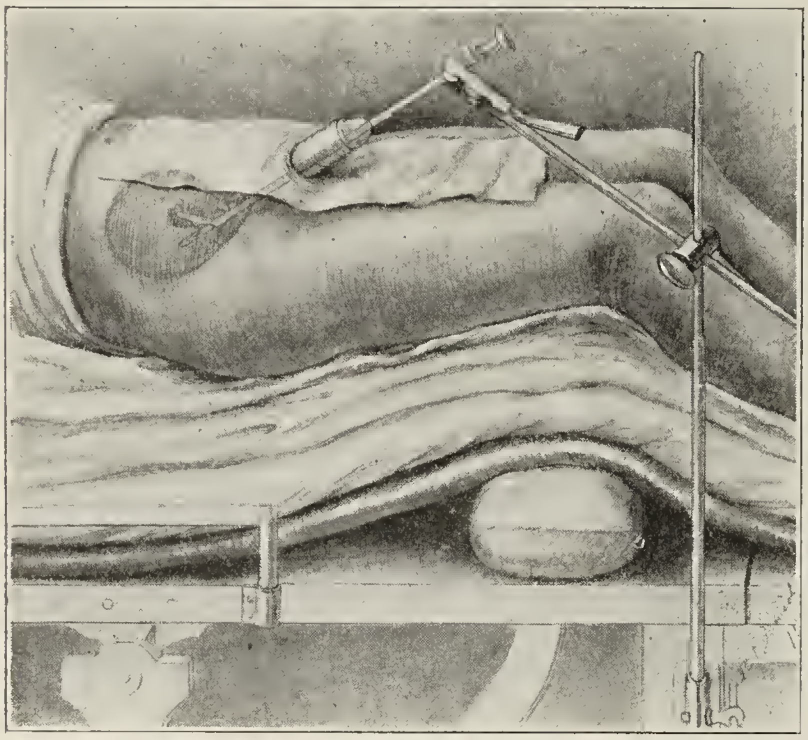

Fig. 3.—Showing use of cystoscopic radium applicator with fixation clamp fastened to table. (Transparency indicating the use of the instrument in the bladder against a vesical tumor.)

TABLE IV.

Radium and fulguration in malignant vesical tumors

No.	Pathological diagnosis			Immediate results		Final results	
				tumor destroyed	tumor not destroyed	tumor recurred	well
33,	Malignant papilloma.	small	11	11	0	1	7
		large	15	14	1	3	8
		multiple	7	7	0	1	3
20,	Papillary carcinoma.	small	4	4			4
		large	11	7	4	6	2
		multiple	5	2	3	2	1
13,	Infiltrating carc.....	small	1	1			1
		large	10		10	8	
		multiple	2		2	2	
1,	Adenocarc	small	1		1	1	

This table would be more satisfactory if the ultimate result were more accurately known in all cases. Where there was doubt as to condition of the patient or the cause of death, they were placed under the query column. The statistics, however, are sufficiently definite to show that, whereas the results obtained are not so good as in benign papillomata, they are really surprisingly good in malignant papillomata and small papillary carcinomata. In large and multiple cases only three patients are recorded as well out of sixteen of these cases. In the infiltrating carcinomata only one case (and that small) is reported cured out of thirteen cases.

In summing up, it may be fairly said that vigorous treatment with radium (100 mg.) applied accurately by a Young cystoscopic applicator and fixed *in situ* by a clamp, followed by fulguration, gives results far superior to fulguration alone in benign papillomata, particularly of the large type, which are often completely resistant to fulguration alone; that in the majority of papillary carcinomata, some large and multiple tumors, radical results may be expected in two thirds of the cases; but that in the infiltrating carcinomata, unless small, this form of treatment is useless, and time should not be wasted in attempting it.

A study of the cases shows that the successful cases have received from 500 to 100 MH. of treatment (five to ten hours with a 100 mg. capsule of radium) and a few cases greater amounts. Among the unsuccessful cases most of the patients received less than 500 MH. but others received very full treatment without success. In cases where the vesical neck or prostate was involved the posterior urethra was treated with the simple (noncystoscopic) applicator, generally supplied with two 100 mg. tubes of radium placed tandem (Fig. 6). In cases where the base of the bladder or trigone or prostate was involved rectal applications were also made. In one such case the treatments were recorded on charts, as shown in Fig. 7. The results of such multiple avenues of attack was in some cases really extraordinary—not only in removing induration and infiltration but also obstruction to urination as well as hemorrhage. By careful placement of the radium on new sites each time, overlapping is prevented and rectal, urethral and vesical burns are quite avoidable. The use of instruments in rectum, urethra and bladder, without accurate determination of the location and fixation at that location, cannot be too strongly condemned. The crux of successful radium treatment is accuracy, and without an accurate technic the use of radium is reprehensible.

In one case, a woman aged seventy-eight years, a very large globular papillary carcinoma was found occupying the whole of the trigone and reaching the vesical orifice. In February, 1917, we implanted needles containing 120 mc. of emanations into the tumor through our tubular urethroscope. The shaft of the needle came out through the urethra.

We were amazed at the rapidity with which this very large tumor disappeared with very few treatments of radium alone. Two years later the patient returned with a tiny, matchhead sized recurrence, which was destroyed by fulguration. She has since been cystoscoped and found well and now, October, 1922, writes that she is well (five and a half years later). More recently Neill (?) has devised an excellent instrument for introducing small emanation tubes into vesical tumors and has reported excellent results. Barringer has employed the catheterizing cystoscope for the same purpose, and very recently Buerger and Cunningham have added technical modifications. It seems probable that endovesical or cystoscopic implantation has a bright future in the treatment of certain bladder tumors.

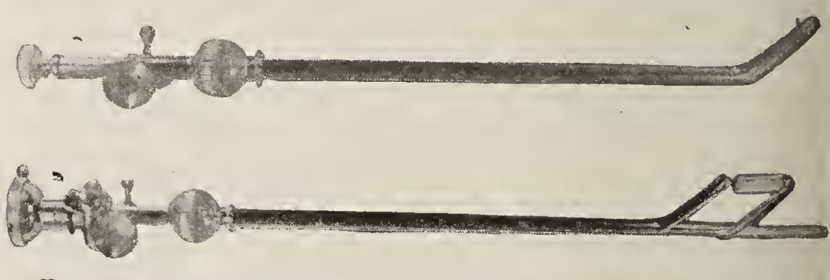

Fig. 4.—Instrument No. 2 closed and open. This carrier is of value for radiating cancer of the seminal vesicle through the bladder when the carcinomatous invasion extends far lateralward.

VII. FIFTEEN CASES OF CARCINOMA OF THE BLADDER TREATED BY IMPLANTATION OF RADIUM THROUGH SUPRAPUBIC CYSTOSTOMY.

In most of these cases an extensive carcinoma was present and they would ordinarily have been adjudged hopeless. As is often the case with radium, it was used in a forlorn hope of arresting the dread disease. Nine of these patients are known to be dead. No reply has been received from three, in two of which improvement was noted as a result of the treatment.

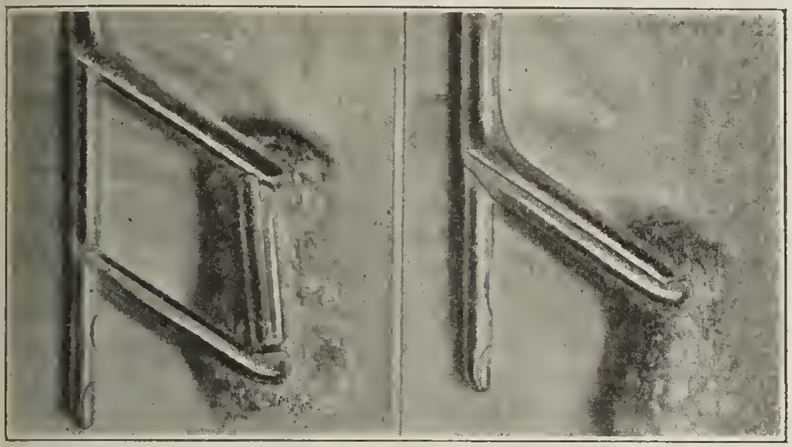

Fig. 5.—The instrument shows the steps in the application of the radium to a tumor back of the ureteral orifice.

Case VI.—One patient, A. H. L., No. 10447, aged seventy, with an infiltrating carcinoma involving the right side of trigone and right posterolateral wall of bladder, received twelve emanation points containing a total of thirty mc. of radium. The immediate result was excellent, the tumor disappeared completely and on discharge the cystoscopic examination showed no tumor present, but the patient died one month later of cancer.

Case VII.—Another case, H. B., No. 8761, aged sixty-five, presented a malignant papilloma, which involved the right half of the trigone, ureter and adjacent lateral wall of the bladder. Treatment by fulguration and radium, 400 MH., by cystoscope was first tried, and then subsequently suprapubic cystostomy was performed and the tumor excised and base cauterized and two "points," four mc. each, were implanted. Reccurrences took place which were treated by fulguration successfully and the patient reports by letter, now two and one half years later, that he is well.

Case VIII.—No. 9450, G. A. R., aged fifty-two years. Large infiltrating carcinoma of left lateral wall involving vesical orifice and trigone to midline; size two by two and a half inches. Deeply cauterized and implantation of four emanation tubes three and a half mc., each imbedded in central portion. These were removed in twelve hours. One year later the patient was apparently well.

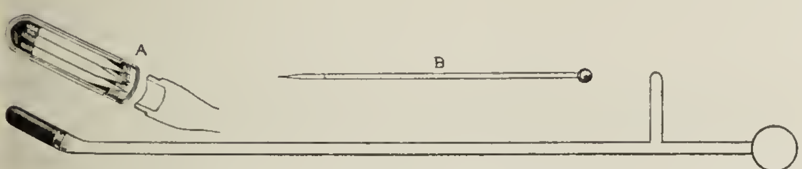

Fig. 6.—New radium applicator with enlarged cap, a, made to contain four needles containing 12½ mg. of radium each, which may be used also for needling through the perineum by means of attachable shaft, b.

Case IX.—No. 9722, A. C., aged seventy-two. Large infiltrating papillary carcinoma of right lateral wall, trigone and vesical orifice, size two by two and a half inches. Deeply burned with cautery by Dr. Geraghty; ten emanation tubes 1.6 mc. each implanted around periphery and two radium needles twenty mg. each in centre. Eighteen months later reported well.

Case X.—In contrast to these four favorable results, another case, C. F., No. 8678, with four small tumors less than one cm. each in diameter and not infiltrating (but found microscopically to be adenocarcinoma) was treated by eight emanation tubes, two and three quarter mc. each, placed one cm. apart, with distressing results, Shortly after operation the patient began to suffer excruciating pain in the bladder, which persisted for months regardless of a subsequent suprapubic excision of a large area of necrotic tissue at site of implantations. Death finally resulted six months later from metastases (apparently—autopsy not permitted). The latter case showed the danger of inserting emanation points of more than one half to one mc.

The fact that our experience with radium emanation points, inserted suprapubically, is not more satisfactory cannot be offered as evidence against this form of treatment. Barringer has reported a few excellent results with it and we intend to give it further trial—using points of small dosage, in reasonably favorable cases of infiltrating carcinoma, which are not in locations favorable for radical resection. The comparative value of radium implantations, and deep cauterization, several successful usages of which have been reported elsewhere in this paper, must be determined by further study of cases and results. In the three apparently good results cited above deep destructive cauterization was employed before implanting the radium.

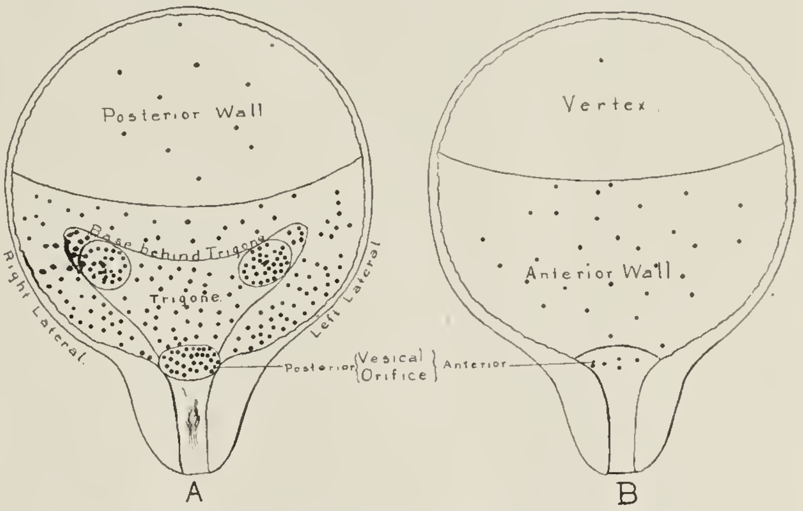

Fig. 7.—Diagram of the interior of the bladder on which has been plotted the location of the tumors in 209 cases of vesical neoplasm, benign and malignant. It is to be noted that only one tumor was found on the vertex, ten on the posterior wall, twenty on the anterior wall and the majority on the trigone and particularly around the ureters and at the vesical orifice.

CASES NOT TREATED.

There were fifty-four cases in which no treatment was given at our clinic for the tumors in the bladder, as the cases were considered inoperable. Twenty-eight of these patients are known to be dead, and many others have not been heard from and are probably dead. Many of these were operated upon a long time ago and at the present time would be treated differently. We would now not be satisfied with simple suprapubic drainage except in exceptionally extensive and manifestly hopeless cases, since the experience of Dr. Geraghty and ourselves with a few remarkable results from cauterization in extensive infiltrating carcinomata of the vesical neck and trigone and more recent cases treated by both cauterization and radium implantations—cases which seem absolutely beyond hope of even temporary improvement.

RELIEF OF DYSURIA—REMOVAL OF PROSTATIC OBSTRUCTION.

In six cases operations were carried out to remove prostatic obstruction, in the presence of supposedly inoperable bladder tumors. In two cases the Bottini electrocautery operation was performed with distinct benefit—urination became less difficult and frequent. In two more recent cases perineal prostatectomy was done with marked improvement in micturition during the five months the patient lived. In the other case the patient has been lost sight of. In another case in which the cystoscope showed a median bar obstruction a Young punch operation was carried out with benefit. In a sixth case, after destroying a pedunculated malignant papilloma with the cautery, a suprapubic prostatectomy was done, and at last report, four months later, the patient was apparently well.

The question of what to do for prostatic obstruction in certain cases of bladder tumor is an important one. Where the obstruction is due to infiltration or tumor growth at the vesical neck or adjacent portion of the prostate it may be relieved by vigorous suprapubic cauterization of the prostatic orifice along with destruction of vesical growths (with or without radium). Where it is evident that nothing is to be expected from suprapubic operation, radium, applied through the urethra, may give marked relief. We have frequently given 500 to 800 MH. per rectum, with good effect. Where the obstruction is due to definite hypertrophy nothing much can be expected from radium, and prostatectomy may be required. Barringer stated that he used the punch operation for certain obstructions due to malignant disease of the prostate, and we have had a few successes with it.

RÉSUMÉ:

A review of the 380 cases which have formed the basis of the report shows that:

About eighty per cent. of bladder tumors occur between forty and sixty-nine years of age, being about equally distributed in these three decades. A benign papilloma in a boy of fifteen years, and a carcinoma in a man twenty-six years of age were encountered, but as a whole the malignant tumors occur somewhat later than the benign.

Both papillomata and carcinomata are much more frequent in the region of the trigone and ureteral orifices and adjacent lateral walls of the bladder and vesical neck. The anterior wall is less frequently involved and the vertex and upper posterior wall are much more rarely involved.

The vertex, anterior, upper lateral and posterior walls are most suitable for resection and excellent results may be expected by radical removal of a wide margin of bladder wall, but that good results may be obtained by resection in the base of the bladder and region of ureters. When the vesical neck and prostate are involved deep cauterization is far more effective than excision.

Fulguration is the method of choice in benign papilloma, but in large tumors radium is of great assistance in causing a rapid disappearance of the tumor, and, owing to the potential malignancy of all vesical papillomata, radium should generally be applied, if possible. In malignant papillomata radium, applied with an operative cystoscope and held firmly in position with clamp fastened to table, is of first value and gives more brilliant results. Here again the conjoint use of fulguration and radium is advisable. The same treatment is sometimes completely effective in papillary carcinomata, and four small and two large tumors of this type and one small infiltrating cancer have been apparently cured by it.

Where the tumor is definitely malignant or very extensive, and particularly if infiltrating, it should be attacked suprapubically; great care being taken not to touch the tumor or break off any papillary processes, and alcohol or resorcin twenty per cent. applied to destroy any that may have dropped into the bladder or wound.

If resection can be carried out successfully with a wide area of healthy bladder wall, whether extraperitoneal or transperitoneal or with transplantation of a ureter, it should usually be done, but the operation should not be so extravagantly extensive as to face a very high mortality rate.

The position of radium implantation is still *sub-judice.* A few brilliant and remarkable cases are reported and we have had some, but always associated with deep and widespread cauterization. Viewed as a whole, however, the gloomy outlook which was held as to the curability of bladder tumors has passed. Fulguration, radium, the electrocautery and careful radical resection have transformed the situation, so that now about ninety-five per cent. of the benign and seventy-five per cent. of the malignant papillomata; about fifty per cent. papillary carcinomata and somewhere near twenty-five per cent. of the infiltrating carcinomata are probably curable by one or more of the methods above referred to.

There is no phase of surgery in which during the last ten years more gratifying advance has been made than in that of tumors of the bladder.

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2. Barringer, Benjamin S.: Radium Treatment of Carcinoma of the Bladder, *Annals of Surgery,* December, 1921.

3. *Idem:* Radium Versus Surgical Removal of Carcinoma of the Bladder. *J. A. M. A.*, October 28, 22, vol. 79, No. 18.

Treatment of Gonococcic Epididymitides With Intravenous Injections of Calcium.—Proceeding from the clinical experience that calcium shows good results in exudative inflammatory processes, Ernst Radnai (*Wiener klinische Wochenschrift,* November 16, 1922) injected five to ten c. c. of a ten per cent. calcium chloride solution intravenously in two cases of gonococcic epididymitis, with the result that the pains were diminished within a few hours and that the swelling of the cord and epididymis were reduced within twenty-four hours with a striking improvement in the general condition.

Retention Neurosis of the Bladder, Secondary to Postoperative Catheterization*

By VICTOR COX PEDERSEN, A.M., M.D., F.A.C.S.,
New York.

From the viewpoint of the urologist, there are often both peculiarity and futility in the commonplace order to catheterize about eight to twelve hours after operation. The peculiarity of the order lies in the fact that the excretion of the urine is necessarily decreased by the anteoperative starvation and catharsis, by the postoperative inhibition of the narcosis and depression of the surgical intervention (perhaps augmented by shock) and by sedative medication for pain and other undesirable primary sequelæ. In my opinion a better rule is that inculcated at the New York Hospital when I was an intern on the division of Dr. Robert F. Weir and the late Dr. William T. Bull. This rule was that no patients were to be catheterized within twenty-four hours after operation unless there were special reasons for earlier relief resident in the urinary system itself.

If the patient complained of a full bladder, the symptom was verified by physical examination—percussion or palpation. Then rather than an early resort to catheterization, a glycerine suppository or small low enema was employed in order to stimulate the bladder reflex through the rectal reflex. In this way the possibility and probability of vesical infections were avoided and, of almost equal importance, annoying hysterical impressions and retention neuroses were not excited, requiring several catheterizations each day for several days or weeks. In illustration of the wisdom of this policy, brief mention is worth while of four female patients. All had been operated upon the day before for pelvic or abdominal conditions. When about twenty-three hours had elapsed without the evacuation of the bladder by any one of them, and while the staff was again operating, the usual written report was received from the nurse, requesting special orders. Two glycerine suppositories were ordered for each woman, with a request for another report within an hour. In considerably less time than one hour another written report announced that all four women had evacuated their bladders naturally, under the stimulus of the suppositories.

In contrast with this simple experience is the following report of a case of retention neurosis secondary to postoperative catheterization, which is perhaps far more common than is usually realized.

Case I.—J. O., admitted to the urological service of St. Mark's Hospital, July 27, 1922. Case No. 3076, female, aged seventeen, Pole, single, no occupation. Her family history was negative, as was also her former personal history, with special reference to urinary disorders, such as enuresis and suppurative and catarrhal inflammation. About five months ago the patient was operated upon at one of the hospitals of this city for chronic appendicitis. An order for early catheterization was given, but in this case it led to a retention neurosis, or hysterical manifestation, which reached the unusual limit of the patient refusing to admit the feeling of a full bladder even when it could be seen and felt, almost as easily as a pregnant uterus at five or six months. At home this child had been catheterized three times a day by her mother for practically five months. Conversely, there were times in the ward when she insisted that her bladder was full when it was obviously empty on rectal and abdominal palpation or percussion.

As the patient did not give a history of disease of the nervous system in childhood and seemed to have no signs thereof on admission, I determined to see what could be done to create the opposite impression in her mind. The first order was therefore not to draw the water for forty-eight hours. This order was nullified by a hyperenthusiastic house officer who had her catheterized because she complained of pain in the bladder, whose fulness he did not verify by percussion. My order was repeated and reinforced by another that day or night I was to be notified before the catheter could be passed. A further direction was that as soon as she complained of a full bladder its condition was to be verified, and if distended it was to be emptied by giving the patient a high oxgall enema and that a large dose of cathartic was to be given so that within four, six or eight hours after the enema had made the bladder empty itself the cathartic would repeat the physiological process in a certain sense from a viewpoint more normal in the patient's impressions than the enema.

It is needless to say that both plans worked well and the child did pass urine, and did admit that she knew herself to pass urine. As she still insisted that she could not void by act of will we renewed the oxgall enema and catharsis treatment, after one day of rest therefrom. In the interval the nurse affirmed that the girl passed urine. The next step was to withdraw all aid whatever, such as the hot water bag, the enema, the cathartic, and small doses of morphine if a really full bladder agitated or distressed the patient, and then to inform the patient that she, herself, must relieve herself as best she could. It is noteworthy to state that she went nearly thirty-six hours without urinating, and did have a visible and palpable bladderful. But I stuck by my orders, and awaited results which were these. When she had to yield to the desire, she could no longer retain the urine, but flooded the bed and floor of the ward and hall on her way to the toilet, where she arrived with her bladder empty. One would think that the shame of such an experience would have conquered the neurosis. But the conquest was only partial. She was again allowed to fill up in the same way several times but was too cute and cunning to become the laughing stock of the other patients and the nurses in the same way. She now denied having emptied the bladder when the nurses knew that she did, and when physical examination proved that she had. I then tried the next moral step which was to inform the child that she could go home as soon as she could show reports by the nurses for three days in succession that she had voluntarily emptied her bladder at least three times a day. This test resulted in practically a consistent and satisfactory demonstration, and the child was discharged greatly improved after twenty-four days of worry and work over her in the hospital.

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*Case report read before the Section in Urological Surgery of the New York Academy of Medicine, December 20, 1923.

A cystoscopy was done by my chief of clinic, Dr. Goldfader, before her admission to the hospital. During the irrigation and distention of the bladder the patient said she had no knowledge of the viscus. The examination showed a normal bladder with moderate trigonitis, apparently of traumatic origin. One would expect a vicious infection to supervene promptly upon home catheterization in an ordinary tenement house, but the child seemed to have escaped at least the severe varieties. A control cystoscopy and urethroscopy were done by myself as soon as the child began to respond to the nonintervention policy. The trigonum and urethra were both granular and unhealthy, although not in a state of actual infection and inflammation. The child had neither vulvitis, vaginitis nor urethritis. The nurses reported that after careful observation by them the girl did not masturbate.

That she had a reasonably normal cerebrospinal system was proved by a physical examination thoroughly carried out by my associate, Dr. Norman Sharpe, visiting neurologist. That she had a weak mentality was illustrated by the fact that she was in bed for only a few days next to a girl having hereditary cerebrospinal syphilis with epileptiform seizures, which she proceeded to imitate quite successfully when she complained of pain in her bladder, including even the twitchings of the face which were the aura of the fits of the other girl.

That her family had peculiar mental poise was illustrated by the fact that her mother raised a disturbance in the office of the hospital, during the period when we were allowing the girl's bladder to fill up. The mother was sure that the girl's bladder would burst. She even tried to climb the fire escape in order to reach the ward where her daughter was because she knew that the bladder had burst and that the girl was dying because we refused her admission to the ward on a nonvisiting day. What would or might happen to the child at home was indicated by the fact that the mother refused to believe reports by the nurse and by me of how successful her daughter had been in voluntary urination and agreed to believe only her daughter's admission if made within her hearing, and without the daughter's knowledge of her presence. With the mother hidden behind a screen the daughter acknowledged that she had passed her urine herself, but doubtless at home the weak policy of yielding to her whims will be resumed at no remote date. For such lasting result as such statements might have, the mother was told in very plain and vigorous terms that if she resumed catheterization the following would be the exact sequence of events for her daughter, in a short time rather than a long time—infection of the bladder, infection and destruction of the kidneys, and death.

In mentioning to my colleague, Dr. Frederick W. Smith, the chief details of the case, the suggestion was made that an x ray picture be taken for the remotely possible discovery of a spinal defect, such as partial spinal bifida. No x ray picture could be included in these notes because the patient and her family refused to have one taken. The laboratory reports showed a negative complement fixation test for syphilis and a urine which was acid, yellow, cloudy, specific gravity 1.012, marked albumin, no sugar, no blood, no casts, few pus and epithelial cells and many bacteria. No culture was done to determine the kind of bacteria present.

In literature cases much like mine are discussed under divergent diagnoses. Of these the following are examples: hysterical retention, retention due to posterior urethral lesions, retention due to nervous causes, or retention due to catheter fear and hysterical ischuria. Ischuria adds another lesion, namely, suppression. Ischuria paradoxa is excessive retention with constant dribbling. Thus the pathogenic processes have not been worked out and settled.

Dr. Edward Preble, who does my research work into medical literature, contributes the following case from memory. It is to be noted that the woman may have been somewhat demented: "The patient in my case was a woman whose age I think was fifty-four, single, retired school teacher. Operation was amputation of the breast for ulcerated scirrhous cancer which did not require much time—no clearing out of axilla, etc. The nurses were not allowed to use the catheter at that time. The woman was naturally apathetic and quite indifferent to exposure. Would make no attempt to cover herself although well able. Dr. William Warren Greene, the famous surgeon who operated, told me she looked like a patient with beginning dementia. I don't recall whether I used the catheter as a matter of routine before there were any symptoms of retention. I think not, for surgeons were afraid of the catheter habit if I remember rightly. There seemed no reason to accuse the patient of any hidden desire to have the genitals handled. This patient I am sure died not long after of recurrence or metastasis. The water had to be drawn during the day and for several nights running I was also routed out. I think there was not much urine on these occasions; if there had been I should have thought her within her rights in rousing me. I do not remember how the case turned out in respect to retention. Her sister reported me to the staff because I seemed unwilling to get up; probably one of the other doctors looked out for her as there were three on duty at the time."

Thus far I have not found the least trace of a case like my own. I see no reason why fear of the catheter or other emotional affect may not cause a spasm of the sphincter with spastic retention.

Dr. Bierhoff reported a case of hysterical retention in a young woman (1). This case is nothing like mine but there is a quotation from Frank von Hochwart, the neurologist, who in eighteen years' practice had seen but four cases of hysterical retention. Bierhoff's patient was an onanist. Jellinek (2) reports a case of retention in a hysterical soldier (traumatic neurosis). This patient believed that he had succeeded in evacuating his bladder by an extemporized roll of paper. What really happened may have been relaxation of the spastically contracted sphincter through mental impression. The cystoscope, however, showed hemorrhagic cystitis and trabeculated bladder, throwing some doubt on the neurotic nature of the case. Jellinek further thinks that the hemorrhage into the bladder may have produced the retention and not any neurosis. He thus reverses his own judgment.

In an extensive paper by Rost (3) on retention without stricture not the slightest suggestion is found of cases similar to mine. Rost is very sceptical over neurotic cases—does not deny them, but thinks all diagnostic resources have not been exhausted in many cases classified as neuroses.

La Roque (4), writing on spasmodic hysterical retention of urine, reports the following case:

Case.—Female, aged twenty, single, hysterical for four or five years past. There were no evidences of nymphomania. She had gone through operations for appendicitis and later phantom pregnancy. The last experience was not explained in full. After each of these operations she had retention of urine, the first time for two weeks and the second not so long. Later she had a fall which was not at all severe but which threw her into a hysterical condition, exhibiting vomiting, colic, hysterical stupor and retention of urine. She had been catheterized several times daily with some irrigation of the bladder for a period not stated. At this juncture I saw her. She presented a slight catheter cystitis with redness of the vesical mucosa. The urine contained a little pus. I filled the bladder with weak permanganate solution and then told her to expel it, which she was unable to do. I then gave her a high colonic enema and sent her to the toilet where the colon and bladder were emptied simultaneously. I told her never to allow herself to be catheterized again. If retention should supervene she was to take an enema. The author has repeatedly seen spasmodic nonhysterical retention after operations for piles. In these cases enemas give relief.

It seemed probable that something might be found concealed in the literature of spasmodic stricture, but the surprising discovery was that there was no special literature on that subject. It seems strange that so many write papers on socalled organic stricture, yet no one has any real contribution on the functional. In papers on retention without stricture there is no report of any positive cases.

Cecil, of Los Angeles, has covered the subject (5). He mentions irritation of the posterior urethra in connection with retention, but does not mention the use of instruments as a possible cause. By way of quasicomparison he mentions the spasmodic retention of esophageal sounds in catheterizing the esophagus, but apparently this is not known to occur in urethral sounding. If it did occur, one could understand how retention might come about. J. Cohn has covered the same subject (6). He has had every opportunity to mention retention due to the catheter but is silent. E. Garceau (7) has published a paper in which women alone were considered. Before he examined his forty-three cases he believed that the catheter did at times sin in this respect, but his studies showed that in all cases irritability existed before the catheterization. H. Lett has covered the entire subject of retention (8). He tabulates all the known causes, naming quite a number, and nothing like the catheter is included. He mentions spasmodic stricture as a cause of retention and cites the influence of emotional causes in its production. Rocher and Müller (9) cover the subject of retention without stricture, quoting two personal cases, one in a man perfectly sound but extremely nervous. The retention was found to be due to spasmodic stricture, but the causation remained a mystery.

An article by Guyon (10) has a remote value. Guyon's second case only is at all pertinent. This patient was at the hospital but a few days and evidently left suddenly without the approval of the staff. He was thirty-six years of age. Owing to his premature departure there was no opportunity to use the manometer to measure the strength of the bladder wall. The history, however, presented points of interest. He had for many years complained of various neurasthenic symptoms but only for about ten months had he begun to suffer from urinary troubles which appeared when his neurasthenic symptoms were at the peak of intensity. The suffering was at times excessive and then in order to void urine he had to squat and bear down and at the same time compress his perineum strongly with the hand, at the same time leaning forwards. This kind of behavior always suggests spinal mischief of some kind and Dr. Polsillon, a neurologist, was called in. He, along with Guyon, was able to exclude spinal trouble of any sort. A most careful examination by Guyon failed to locate any urinary anomaly. The membranous portion was only slightly more resistant than normal, the calibre of the urethra quite free, and the prostate normal for the man's age. The bladder, examined with a metal explorer, was barely sensitive and could be freely distended. It could be emptied only imperfectly—slowly and without propulsion. While as stated the manometer was not used, Guyon is certain that the wall of the bladder was enfeebled. The neurasthenic symptoms, aside from severe headaches, often persistent, consisted chiefly of physical fatigue after slight exertion, which would at times compel him to lie abed next day, with extreme mental depression and boredom. He was indifferent as to his disease.

The works of some of the old masters of urology, like Guyon, lead to nothing to the point. I do not find anything, even a catheter habit. The admonition was considered sound to avoid promiscuous catheterization in women lest through suggestion they become unable to void spontaneously. At a later interval came the teaching about concealed onanism, when the medical man was warned that female retention might be feigned to obtain the manipulation. Even this is not mentioned by systematic writers. There is nothing about catheter fear, but there is doubtless such an impression, so that many individuals wait until the last moment before having their water drawn. An unconscious fear might possibly cause reaction like vaginismus.

There is a small literature on hysterical ischuria, which is, of course, not retention but partial suppression. It has nothing in common with hysterical retention although might be readily confused with it and the two have to be differentiated. Frew (11), who reports a case of this, at first looked upon it as one of retention. The subject was notoriously hysterical and he spoke of aversion to beginning the use of the catheter on such a patient. It turned out to be ischuria.

SUMMARY.

There seems to be and there should be a cautious doubt as to what weight shall be attached to such procedures as catheterization and to the psychoneurotic status of the subject. Some men reject the idea of hysterical or neurotic retention and write as if they thought they had been imposed upon by the patients.

The question is at once suggested, "How can the skeptical medical reader be convinced that passage of the catheter caused the retention neurosis!" There is no moral doubt of course in my case. In the strict sense the experience would have to be repeated in the same subject. The diagnosis of psychogenic retention always arouses a faction to dispute the use of the term. Its possible occurrence in general is not denied, but the individual case report is criticized. If the psychogenic nature is conceded, with so many inhibitions possible in theory, how can it be shown that passage of the instrument was at fault? The silence of the profession may indicate a disinclination to attribute retention to the catheter. The number of motivations and inhibitions which might enter into the psychology of such cases is large. A neurologist would place some of the responsibility on other factors.

Yet here is a girl whose impressions were so definitely and immediately productive that she began in a couple of days to imitate epileptiform seizures, borrowing even the aura from a neighboring patient. It is very probable that the impression of not being able to urinate after operation followed by the impression of relief after passing the catheter made the latter temporarily a fixed idea to her. The facts and course of the case seem to justify reporting it and comparing it with allied cases in literature.

Since this paper was completed, the following incidents have occurred and should be included in the report for the sake of completeness:

After this patient had been away from the hospital for a long time letters from the social service department and myself have remained unanswered, either by letter or call. During my vacation in October, 1922, she made one visit to the clinic and then disappeared again. Finally on December 20th I sent the social service nurse to her last address. The result of this visit is that the girl is calling twice a day at a nearby hospital for catheterization. It seems then that the fears expressed early in this paper, about the conduct of the family as to the whims of the patient, have been fully realized. The hospital at which she reported made no inquiry into what I had accomplished. If this inquiry had been made, it is probable that the same plan of treatment following immediately on mine, because concurred in by other doctors, would have convinced and thus cured the patient. The general attitude of the hospital in question can not be described as one of the highest social service relation.

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45 WEST NINTH STREET.

Röntgen Ray and Radium Therapy of Hypertrophied Prostates

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A survey of the records of twenty-five personally treated hypertrophied prostates, representing all types and stages of prostatic urinary obstruction, forces to my mind the inevitable conclusion that this condition fits into the constantly enlarging group of conditions treated effectively by radiation, and therefore, should no longer be considered absolutely surgical. I lay no claim to originality in the method of treatment, although my technic differs somewhat from other methods described, and my conclusions coincide in some respects with those of other operators, previously reported. However, if the patients are to be considered first and always, the following should be considered an earnest plea in their behalf.

The subject of prostatic hypertrophy is of all absorbing interest, occurring as it does late in the prime of life, with no definite established etiology for its basic pathology. Niemeyer's study of thirty-five cases has convinced him that prostatic hypertrophy is a compensatory hyperplasia on the soil of senile involution (1). It is quite generally conceded, however, that prostatic hypertrophy is the result of chronic inflammatory changes. In my opinion, it is highly probable that the abnormal involution of the gland, at the close of the sexual life of the patient, is contributed to by long continued irregularities in sexual habits. The histories of the majority of the patients in my series showed that interrupted coitus had been practised for several decades and in not a few cases masturbation had been practised regularly over long periods.

The types of cases treated must of necessity be grouped, clinically, according to the character and severity of the symptoms and to the physical examination of the prostates, as determined by x ray examination, digital examination through the rectum and by cystoscopic examination. A pathological classification of the prostates treated was of course impossible, owing to the uniform and fairly rapid termination to complete and so far permanent symptomatic cures, and the consequent lack of pathological specimens. The great majority of the prostates were of the large, soft, elastic type with no irregularities in surface or contour, representing the glandular type of hypertrophy. There were a few of the smaller, hard, fibrous type, these being in the minority. All degrees of prostatic obstruction were represented in the group, and as is usual in this condition, most of them were complicated by cystitis. Three of the patients had been living absolute catheter lives from several weeks to two years. Varying amounts of residual urine were present in all the patients who were catheterized. All the patients had not responded to the usual methods of medical treatment (in contradistinction to prostatectomy) and twenty per cent. were such poor operative risks as to be condemned to catheter lives for the rest of their miserable days.

The technic, which was planned and followed with few variations from the first case, was as follows: Four areas measuring approximately three inches square are marked off on the lower portion of the abdomen and over each groin, centreing about the symphysis pubis, and four more areas posteriorly, over the region of the tip of the coccyx, all conveniently arranged for crossfire radiation of the prostate gland. Each area is treated successively with seventy-five milliampere minutes, nine inch back up, twelve inch distance, through four millimetres aluminum. When this is concluded, an intrarectal application of one to two hundred milligram hours of radium through brass and rubber is given, crossfiring on the prostate gland. About two weeks' time is consumed in the giving of this round of treatments, followed by two weeks of rest. Three rounds of treatments, as outlined above, suffice to produce sufficient involution of the gland to accomplish complete symptomatic relief, so that practically in every case the patient is completely relieved of obstructive symptoms at the end of three months. However, it is not necessary to wait this long for definite improvement, for in the uncomplicated cases improvement is noted in three or four weeks' time, with alleviation of most of the distressing symptoms, and by the end of the second series of treatments the patients are almost all symptom free, many sleeping through undisturbed nights and no longer conscious of having urinary bladders. To quote one enthusiastic exsufferer, "I am as good as a youngster again." In the case of three patients, who were very greatly debilitated, practically bedridden, and therefore could not come for x ray treatments, radium packs of three hundred milligram hours through brass and rubber and one and a half inches of toweling, were substituted for each x ray exposure, in the technic outlined above.

The treatment of existing complications in the more serious of the cases was not discontinued or lessened until there was considerable diminution in the obstructive symptoms, which usually took place after the second round of treatments. The usual treatment for cystitis, vesical tenesmus, etc., was carried out here as elsewhere, until with the establishment of better drainage they were gradually disposed of. No amount of detailed exposition of the advantages of this method of treatment could be as convincing as a few case histories which, in order to be entirely free from even a suggestion of coloring from my enthusiasm, are quoted verbatim from the records of referring physicians.

Case I.—E. S., aged eighty-six years, was referred by Dr. H. Adler, who had been called at 3 a. m., April 27, 1921, to see the patient for sudden syncope. He found him very pale with bradycardia (pulse 48), and a hypertrophied and dilated heart; blood pressure, 180-120. He administered atropine hypodermically which gave relief. The patient complained of frequency of urination, voiding small amounts of from one to two ounces every half hour to an hour. The prostate was the size of a small grapefruit and moderately firm. The cardiac condition improved gradually, and by May 2d the pulse rate was 66 a minute. On May 3d a sudden urinary retention developed, for which catheterization became necessary. The patient then had to be catheterized about five times daily. Operation was advised against on account of his cardiac condition, and he was referred for x ray therapy, which was started on May 6th. By May 17th he was again able to void spontaneously, and the prostate was found to be slightly reduced in size and firmer. On account of cystitis, catheterizations and irrigations were continued daily, then semiweekly until the end of June. The residual urine, at first more than an ounce, amounted to only a few drops when the treatments were discontinued. During this time and subsequently the patient had a number of attacks of bradycardia and syncope.

In November, 1921, there was a recurrence of the acute retention. The x ray treatments were again instituted, with similar but quicker results than in the first attack. In March, 1922, there was a third attack of urinary retention. This time the patient was treated with radium, after which the prostate diminished considerably in size. Examination towards the end of May, 1922, showed the prostate considerably smaller and firmer, and no residual urine in the bladder. Although seen a number of times during the past eight months for the cardiac condition, he has not had any complaints nor symptoms referable to prostate or bladder.

Case II.—S. R., aged sixty-four years, was referred by Dr. I. Ritzfeld, who was called in an emergency in the summer of 1922, and on arrival found the patient in agony as a result of acute urinary retention. "I catheterized him, which gave him temporary relief. On questioning him, I learned that he had had similar trouble on previous occasions. He told me that it was necessary for him to void his urine as often as fifteen times a night, and that he found it almost impossible to attend social affairs, as a result of the constant desire to urinate. Upon further questioning, I found that he had been losing in weight, had become irritable, suffered from insomnia, and loss of appetite. I prescribed urotropin, ordered a specimen of urine examined, and advised hot stupes over the lower abdomen. I further advised that this matter be taken up with the patient's family physician and advised that he try a course of x ray treatments. I saw him a few times soon after and then referred him to Dr. Philips for radiation treatment.

"Since having been under Dr. Philips's care, my later report showed that there had been an unquestionable improvement in his general health, along with marked improvement in his urinary symptoms. The urinary frequency and irritation had disappeared, increased amounts of urine were voided at a time, and examination of the prostate showed considerable diminution in its size. The man was able to attend to his business and social affairs, had lost his wan and anxious expression, and had gained in weight. His nocturnal frequency had disappeared and he frequently slept throughout the entire night without disturbance."

CONCLUSIONS.

Analysis of the series of cases warranted the following conclusions:

1. The quickest results were secured in those cases which had the slightest obstructive symptoms, with the fewest complications, and for these reasons cases should be referred for radiation as early as possible, before obstruction, cystitis, impaired kidney function, etc., have definitely established themselves.
2. In the more severe cases, the supportive treatment should not be withdrawn until there is considerable improvement in the drainage of the bladder.
3. Although no uniform considerable reduction was noted in the size of the prostate glands, nevertheless all the patients were completely relieved of obstructive symptoms, in from one to three months' time, depending on the severity of the complications.
4. Recurrence of the obstructive symptoms has not occurred in any of the series, which includes two three year cures.

It is of the utmost importance that malignant cases should be excluded from a course of treatment such as that outlined above, for unquestionably the effect would be stimulating to the growth. Where malignancy is suspected, which should always be the case when continued bleeding is present, or when there are any irregularities in the contour of the gland, cystoscopy should be performed, if feasible, to aid in the exact determination of the condition. It is highly gratifying to remember that cancer rarely begins in a hypertrophied prostate, and that less than one per cent. of hypertrophied prostates are malignant (2).

The presence of vesical calculi, in my opinion, is no contraindication to radiation as the method of choice, in the treatment of hypertrophied prostates. Cystotomy with the removal of the calculi is practically a minor surgical procedure, free from the usual risks of a major operation, and in no way compares in severity with enucleation of the gland. The fact that the first stage of prostatectomy has been done to accomplish the removal of vesical calculi is a poor argument to warrant the following surgical procedure, in view of what can be accomplished painlessly and without risks by radiation. On the contrary, the presence of the cystotomy wound will facilitate and hasten recovery by affording direct access to the bladder for treating the complicating cystitis, and for direct application of radium to the bladder surface of the prostate gland.

In an attempt to establish the actual cause of the relief of symptoms, an original investigation was carried out as follows: The testicles of three of the patients were subjected to sterilizing doses of radium and x ray, the scrotum of each patient being delivered through a fenestrated lead sheet, which afforded effective protection to the prostate and bladder from the rays. These patients were observed for two months without any further treatments. No appreciable change in their condition as regards the bladder or prostate was noticeable. Inasmuch as the treatments could be deferred no longer, on account of threatened discontinuance of cooperation on the part of these patients, they were then subjected to the routine course of treatments described above, with the usual results.

The opposite procedure was now carried out with three other patients, i. e., the testicles were protected with heavy lead sheeting from any possible scattered as well as direct radiation. They were then exposed to the routine course of therapy described above. No appreciable difference in the results secured in these three cases was noticeable, when compared with those cases in which the testicles were not protected. The results of these experiments forced the conclusion to my mind that the relief of prostatic obstruction was the direct result of radiation of the prostate gland and the bladder, in the former by a destruction and absorption of the hypertrophied adenomatous structures, and in the latter by an intense stimulation of the bladder and mucosa and musculature.

These experiments were stimulated by the obsolete operations of castration and vasectomy of Chetwood (3) and Harrison (4) and more recently the reports of Steinach (5), Haberer (6), and Benjamin (7) of vasoligation for the relief of hypertrophied prostate glands, and in addition, by the great similarity between fibroid uteri and hypertrophied prostates. With respect to the former, in the relief of prostatic hypertrophy by radiation castration was not actually anticipated, because of the uniform action of radiation on the entire testicle, as contrasted with the selective action of vasoligation affirmed by these investigators. The comparison between fibroid uteri and hypertrophied prostates deserves more than passing comment. Embryologically, the homologue of the prostate in the female comprises a group of glands in the urethra including Skene's gland, Bartholin's glands, and a few minor vestibular glands. However, the organ which is the actual counterpart in the female of a hypertrophied prostate is a fibroid uterus, not only histologically but also because of some probable similarity in their respective relationships to testicle and ovary.

Here, diverting still farther, a pathological report of a fibroid uterus might well apply to a histological description of a hypertrophied prostate. Glandular proliferation, fibrosis and the production of multiple small spheroidal tumors, will be found in the individual description of both conditions. These experiments, in view of the possibilities of individual and separate radiation of testicle and prostate, as contrasted with the inseparable radiation of uterus and ovary, due to the differences in their respective anatomical relationships, may throw some light on the existing controversy between the French and German schools of therapy, as regards their respective explanations of the reduction by radiation of myomatous tissue. According to the French explanations, shrinkage of these tumors is the result of the direct action of the rays on the fibromyomata, whereas the Germans maintain that the effect is a secondary one and that the rays are efficacious only through their action on the ovaries (8). Without doubt, if the logical comparison is at all permissible, the experiments described above substantiate the French theories.

The question naturally arises at this point, why has the radiation of fibroid uteri so completely outdistanced that of hypertrophied prostates, when they are identical in so many characteristics? How can one account for this discrepancy, when on the one hand radiation therapy of fibroid uteri has completely supplanted operation, except where some definite accepted contraindication exists, such as extreme youth, pedunculated tumors, the presence of infection in the pelvis, etc., whereas in hypertrophied prostate glands comparatively few of our professional brethren are even aware of this nonoperative means of alleviation of the condition? I feel that the members of my specialty are at fault for not investigating this subject before this time, and acquainting the profession at large with their results and teaching them that probably as much can be expected from the radiation of hypertrophied prostates, painlessly and without operative risks, as from the parallel condition of the fibroid uterus.

It is indeed surprising, considering the general prevalence of prostatic hypertrophy, and the advantages of the radiation form of treatment, that so little has appeared in medical literature on this subject. The first record of any case treated, that I have been able to find, was published in the year 1907 by L. B. Bangs (9). Temporary relief was secured in this case after radiation was directed through the perineum only. All the symptoms recurred. In 1920, reports of röntgen ray therapy of hypertrophied prostate glands were published simultaneously by Haret (10) in France, and Oppenheimer (12) in Germany. It is the opinion of both these investigators that x ray therapy is the logical treatment and relieves symptoms where glandular hypertrophy only is present. Beyond this, both authors are skeptical of beneficial results.

Less than two years ago, S. Stern (10) reported excellent results with x ray radiation exclusively. His technic was the administration of direct radiation to the rectal surface of the prostate gland through the rectum by means of a leaded glass speculum. He supplemented this radiation by crossfiring through the perineum. He reported two five year cures of very severe cases, but called attention to the difficulties encountered in the more severe cases where sacculation and loss of bladder tone interfered with a thoroughly ideal end result.

This brief summary of the results of radiation therapy of hypertrophied prostate glands, even excluding the results in my series, shows unquestionable progress in the results attained. It is my firm opinion that in the near future more extensive and widespread experience with the method and probable improvements in technic will definitely establish radiation as the method of choice in the treatment of this condition.

A brief survey of the surgical aspects of this condition is appropriate before concluding this presentation. Notwithstanding the fact that H. H. Young (11) recently reported a series of 165 consecutive prostatectomies without a death, the facts remain that the mortality in selected cases with operators of wide experience is three to seven per cent., whereas in unselected cases, with less experienced operators, the operative mortality is as high as twenty-six per cent. Additional evidence regarding the gravity of the surgical treatment of this condition is given by the postoperative mortality of seven to nineteen per cent. It must be remembered that not all patients can avail themselves of special urological service where everything is as it should be. The average case is the unfortunate one, which because of complications and urgency is treated in his own community with, as a rule, considerably increased risks.

Mention must also be made of the postoperative complications and sequelæ which require expert attention and skill. Among these, in their order of frequency, are wound infection, pyelonephritis, epididymitis, phlebitis, hemorrhage, cardiac disease, and uremia, any of which gives grave concern to the operator and not infrequently contributes to fatality (16).

Less important among the objectionable features of operative treatment are the discomfort, pain and anxiety, from the disturbing and irritating urinary leakage from the cystotomy wound.

In spite of improved technic and lessened operative mortality in recent years, prostatectomy, with its dangers, complications and sequelæ, remains a serious major operation, and is still undertaken frequently with reluctance as the last rational procedure. The advice of DaCosta given years ago (17) summarizes most effectively the dangers of operative treatment, and in most respects his comments obtain today. "Give palliative measures a reasonable trial; if they fail, operate. Prostatectomy is altogether too grave an operation to be resorted to as a routine treatment for every enlarged prostate. The operation is not to be regarded as a trivial affair, certain to result in a cure. It is a grave procedure, with a considerable mortality, which may be attended by disastrous complications, and from which unfortunate consequences may arise."

In the preceding, the author feels that he has substantiated his introductory remark, that the treatment of hypertrophied prostate should no longer be considered absolutely surgical, and he will add that in his opinion, the routine treatment for this condition should be radiation, and operation reserved for radiation failures, should they occur.

SUMMARY.

1. X ray or radium therapy offers a painless, nonoperative method of reducing hypertrophied prostate glands and relieving prostatic obstruction.

2. The effects of radiation are due to destruction of the adenomatous structures in the glands and to stimulation of the bladder mucosa and musculature.

3. Sterilization of the testicles with radiation produced no appreciable effect on hypertrophied prostate glands.

4. Exclusion of the testicles from direct and scattered radiation in the routine series of treatments caused no appreciable differences in the usual results.

5. Radiation therapy should supplant operation as the method of choice in the routine treatment of hypertrophied prostate glands and operation reserved for radiation failures should they occur.

The author's references will appear in his reprints.

Prostatectomy

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Prostatectomy has become a most satisfactory surgical operation, being safe and followed by normal bladder function. The patient with prostatic obstruction, whether the gland is large or small, suffers from urinary retention of a few ounces to sixty or more. He is more or less toxic even with an uninfected bladder, but with the latter condition impairment of health is more pronounced and the kidneys, liver and digestive tract are under added stress. The prostatic patient is under weight and one of the results of prostatectomy is a marked increase of weight and vigor.

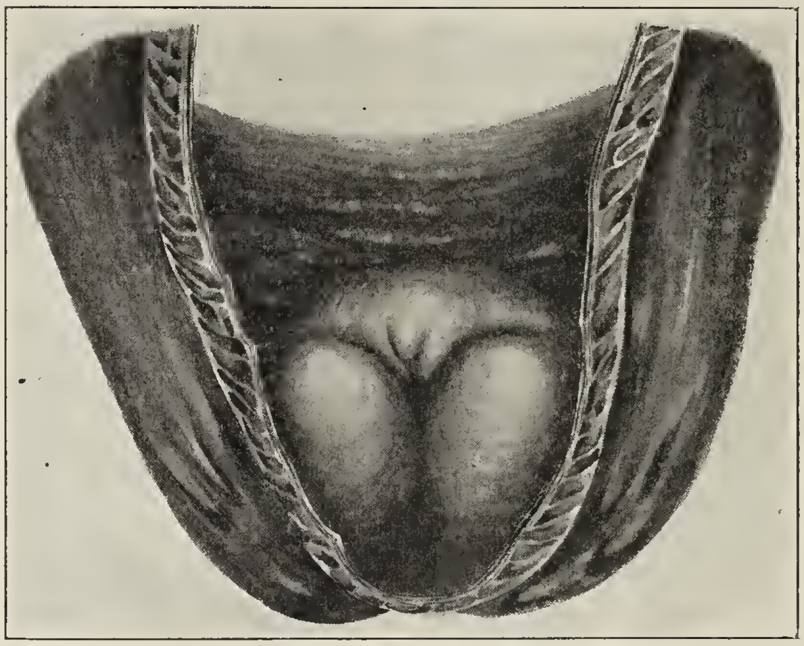

Fig. 1.—Common types of prostatic obstruction. (Anteriorposterior views of lower bladder.) Hypertrophic prostate, raising internal meatus above bladder base.

TECHNIC.

With the improvement in technic little remains to be accomplished in this common operation, and with the avoidance of complications we now urge early prostatectomy. The operation is done under spinal anesthesia and through a suprapubic incision. After retracting the bladder walls and inspecting its interior for the presence or absence of stone, the prostate tumor is completely detached by means of the index finger of the right hand, usually assisted by that of the left within the rectum, the prostate being lifted. The loosened gland is then removed by means of a sponge clamp.

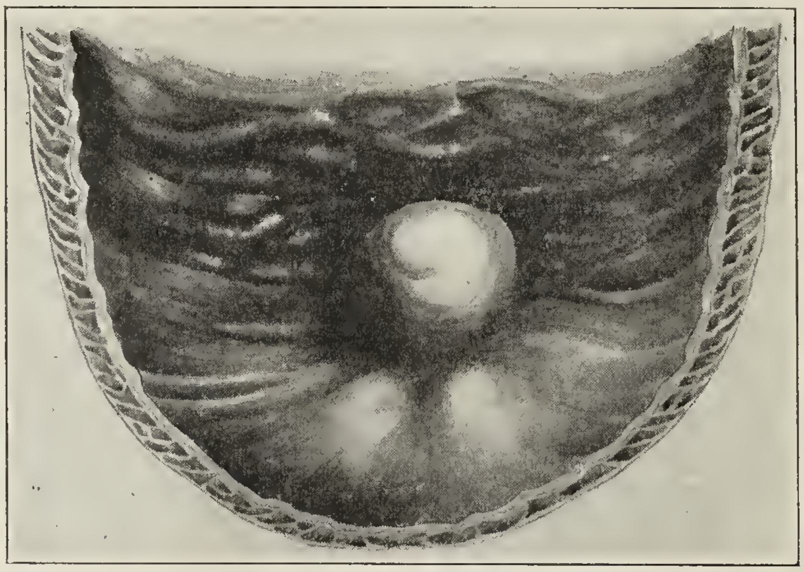

Fig. 2.—Middle lobe hypertrophy forming ball valve obstruction of internal meatus.

AFTERTREATMENT.

The immediate aftertreatment in these cases is now varied from the hitherto usual procedure. Packing of the bladder or the use of special means to exert pressure upon the site freed of the tumor is unnecessary and thus afterdistress and chances of infecting the bladder are obviated. The only step indicated is thorough irrigation with warm boracic acid solution and the reinspection of the bladder to remove any tissue that may have escaped the cleansing irrigation.

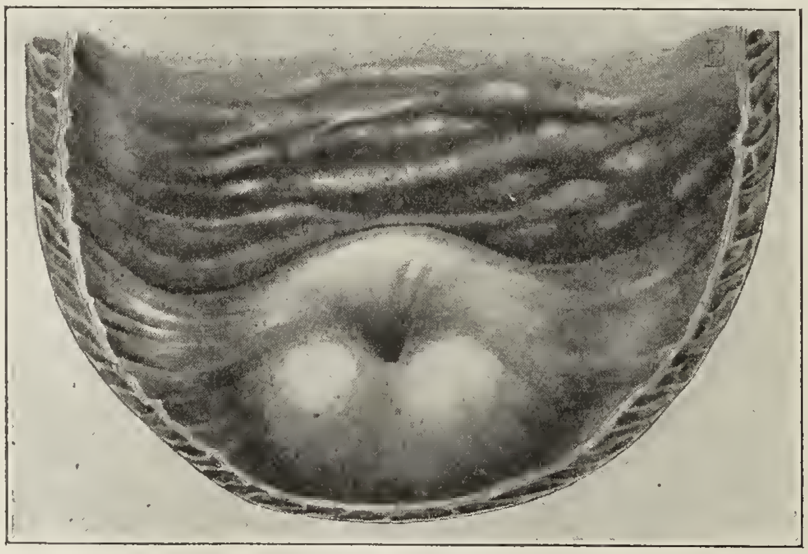

Fig. 3.—Sclerotic prostatic obstruction.

The reason for absence of hemorrhage is twofold—first the spinal anesthesia and secondly the intracapsular enucleation of the enlarged gland. Spinal anesthesia is associated with a moderate drop in blood pressure which persists for an hour or more and does not fully return to the previous registration until the patient is out of bed. Moreover, the shock, associated with ether anesthesia, is absent. The bloodvessel wall therefore contracts immediately and firm clotting occurs normally. Of minor import is the intracapsular enucleation, since in no other way can the gland be properly and cleanly removed. Following the operation a tube for suprapubic drainage is alone indicated.

CONCLUSIONS.

In conclusion we emphasize the importance of removing the obstructing prostate before toxic symptoms occur and kidneys and liver are taxed with products of urinary retention. With favorable conditions the operation is done in one stage, under spinal anesthesia, with no after drainage with the exception of a suprapubic tube which is left in place for one week.

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Unsuspected Syphilis*

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There are three distinct classes of syphilitic patients who apply to the physician: 1. Those with symptoms or lesions which they know to be due to syphilis; 2, those with symptoms or lesions of which they themselves are doubtful, and 3, those with no thought of syphilis in their minds. It is this third class which is probably the most important, as the possibility of their disease being overlooked is very great.

This class of patients may present symptoms or lesions which are obviously syphilitic and a diagnosis may be reached at once. However, the majority of them present themselves to the physician with more or less vague, indefinite symptoms, and a correct understanding of their cases may be most difficult. These patients most frequently apply to the general practitioner, who will often fail to make a correct diagnosis unless he is careful and constantly remembers that syphilis may cause almost any symptom complex.

On the other hand, cases are sometimes observed which are obviously syphilis, and it may be well to mention here some of these cases and point out some of the pitfalls which the physician may encounter if he relies entirely upon the presenting symptoms and does not take into account the whole clinical picture of the case.

A typical chancre of the genital organs, particularly of the male, would present little or no difficulty of diagnosis even if taken by itself. However, a positive diagnosis of syphilitic chancre should never be made of any lesion without an examination for the Spirocheta pallida. In like manner the early adenitis developing in the inguinal region soon after the appearance of the genital lesion, which is usually bilateral, but may be unilateral, is also of little diagnostic value. The early syphilodermata are usually typical and when taken in conjunction with a genital lesion and an adenitis may be considered pathognomonic of syphilis. The same may be said of early mouth lesions.

The congenital syphilitic, the typical weasened, pitiful infant with the hoarse, raucous voice, the snuffles and the bullous syphilodermata cannot be mistaken for anything else. In older children born with the taint of syphilis, developing a deafness, a typical set of Hutchinson's teeth and interstitial keratitis at about the age of puberty, a diagnosis of congenital syphilis is easily made. In fact, the development of these three symptoms known as Hutchinson's triad, is pathognomonic of congenital lues. Between these classes of cases, which we may term as obvious syphilis, and the types which are unsuspected both by the patient and the physician, there are a great number of cases which may be called suspicious syphilis.

In this class belong all genital lesions, and the oft reiterated note of warning in regard to genital lesions is possibly not out of place here. No genital lesion, no matter how trivial or how typical of some other condition, should be passed by without a thorough investigation into the possibility of its being syphilitic. Here the dark field becomes almost the *sine qua non*. In my opinion the staining of smears is almost valueless except in the hands of an expert. However, a recent method of examination, which is full of promise, has been developed by Klauder and Kolmer (1) and amplified by Stern and Rypins (2). This consists of applying the Wassermann test to fluid collected from the lesion. In untreated and uncomplicated syphilitic chancres this is usually not necessary, except in the absence of a dark field apparatus. But in chancres complicated by chancroid, phagadenic chancres, and in those which have been treated by some type of cautery, this method becomes of the greatest value, as a positive is frequently obtained before the blood collected in the usual manner becomes positive. One single negative dark field examination or one single negative Wassermann on the chancre fluid is not enough; at least three or four should be made, and these should be followed by frequent Wassermanns on the blood until all danger of a syphilitic infection is passed.

The inguinal adenitis following a genital lesion, if bilateral, is suspicious, but not at all pathognomonic. Here an aspiration of some of the gland juice and examination by the dark field is often of value. In like manner the later adenitis, particularly the bilateral epitrochlear enlargement, is suggestive of syphilis, and should lead the physician to make a most careful investigation for other evidences of this disease.

It has well been said that the syphilodermata may mimic any known skin lesion: For example, the roseola may often resemble measles, the pustular syphilodermata, the lesions of smallpox, and certain gummata of the skin, epithelioma. It therefore behooves the physician to consider the skin lesions with which he comes in contact and which he thinks are syphilis as possibly something else until he proves them specific.

Periostitis, particularly of the shafts of the long bones, is most suggestive of syphilis, and in cases of dull or severe pain, of tenderness and more or less swelling in one of these bones, and to which no local cause can be ascribed, syphilis must be considered. Aortitis is often mentioned as being caused solely by syphilis. However, this is probably not the case, although a definitely diagnosed aortitis should be looked upon with suspicion until some other etiological factor has been determined. Certain neurological findings, such as increased or absent knee jerks, and pupil abnormalities, are suggestive of syphilis of the central nervous system, but are not pathognomonic and should therefore be thoroughly investigated before a diagnosis is made.

In the realm of congenital lues any one of Hutchinson's triad, Hutchinson's teeth, an interstitial keratitis, or a deafness developing near the age of puberty, is suspicious, but taken alone cannot be definitely assigned to a syphilitic etiology.

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The symptoms and lesions which are due to syphilis and of which the patient is totally unsuspicious as being caused by this disease are legion and it will be possible in this paper to point out merely the most important of them. As a rule most intelligent patients are more or less suspicious of a genital lesion, although many of them often consider such a lesion as a "hair cut," as it is known in the vulgar vernacular.

Extragenital lesions almost never are looked upon by the patient, and comparatively rarely by the physician, it must be confessed, as syphilitic. It should be stressed, however, that any sore which progresses in spite of the ordinary surgical procedures, particularly if situated on the lips, tongue, tonsils, or, especially in physicians and nurses, on the fingers, should be investigated most carefully and syphilis ruled out or found. Chancres of the mucous membrane of the nostrils, of the conjunctivæ and of the nipple are not rare, so lesions of these localities should not be passed by with no thought of lues.

Perhaps enough has been said concerning the syphilodermata, although it may be well to mention the converse of the postulate outlined above, that is, that at least a great number of the skin lesions which are presented to the physician for diagnosis should be looked upon as possibly syphilitic until they are proved to be otherwise.

Of the general symptoms which are often observed in syphilis malaise may be mentioned. This is often quite marked soon after the appearance of the chancre and in cases of extra genital lesions might be most suggestive.

Anorexia is usually more or less marked, especially during the socalled second incubation period and during the active manifestations of the disease. However, during the second incubation period bulimia may exist and should be looked upon with suspicion.

The most important of the general symptoms of syphilis is the fever, and it is also one which is frequently overlooked, and particularly is it true that a fever of unknown etiolgy is rarely considered by the physician as possibly luetic. During the course of the chancre there is usually no deviation of the temperature from normal. In the phagedenic type of chancre, however, there may be a rise of temperature. The early adenitis also is rarely accompanied by fever but in mixed infections, when suppuration takes place, a rise of temperature may be observed.

The socalled syphilitic fever may be divided into two types: 1, essential syphilitic fever, that is, fever directly due to the action of the Spirocheta pallida and their toxins, and 2, symptomatic syphilitic fever. Of the essential type of syphilitic fever there are three varieties: 1, continuous, or typhoidal; 2, intermittent or malarial, and 3, mixed, which resembles the fever of pyogenic origin.

The continuous variety of the essential type of syphilitic fever is most frequently seen during the socalled secondary incubation period, or as an accompaniment of the early cutaneous lesions, the roseolar or early papular syphilodermata. The temperature gradually rises after prodromal symptoms of malaise, anorexia, etc., rarely going above 38.5° C. (101° F.), although in rare instances a temperature of 39.5° C. to 50.5° C. (103° F. to 105° F.) may be attained. When such high temperatures are observed it is usually during the second incubation period and upon the appearance of the syphilodermata the temperature drops to about 39° C. (102° F.) and remains at that period for several days. It has been stated (Fournier) that this variety of syphilitic fever occurs in about twenty per cent. of syphilitics, but I am of the opinion that it occurs much more frequently, possibly in nearly all cases just prior to, or as an accompaniment of, the early syphilodermata.

The second variety of the essential type of syphilitic fever, the intermittent, is usually observed somewhat later in the course of the disease either with other manifestations or in the socalled latent syphilis. It begins with a chill, usually in the evening, or more often simply chilly sensations, as a distinct rigor is rare, and is followed by a comparatively gradual rise in temperature to 39° C. to 40.5° C. (102° F. to 105° F.). The temperature continues for several hours when there is a more or less profuse perspiration and a fall in temperature. This cycle is repeated daily, nearly always beginning in the evening but at a variable period, and may last for several days or even weeks in the absence of specific therapy.

The mixed variety of the essential syphilitic fever also occurs as a rule later in the course of the disease and with or without other symptoms. It usually is ushered in with a more or less severe chill followed by a rise in temperature of 38.5° C. to 39.5° C. (101° F. to 103° F.) or even higher. This is maintained for a day or two, when it may drop to normal or nearly so, only to rise again to its former height or higher.

The symptomatic type of syphilitic fever is the accompaniment of evident involvement of certain structures and organs in the syphilitic process. Thus, it is frequently seen in syphilitic arthritis, iritis, periostitis, etc., in the earlier course of the disease, and later with gummata of the various organs. It is usually a continuous type of fever and as a rule the temperature does not rise to over 39° C. to 39.5° C. (102° F. to 103° F.). It may last for several days or even a week or two in the absence of proper medication.

Of the blood picture in syphilis little need be said except that it is now fairly well recognized that a lymphocytosis is a rather constant finding and should be looked upon with suspicion. Graves (3) has also pointed out that there is often an apparent anemia, that is, a pallor and an anemic look to the countenance away and beyond the blood findings.

Syphilis of the heart is of comparative frequence and certainly when this organ is found to be diseased a luetic etiology should always be considered. Syphilitic myocarditis is more frequent than is involvement of either the endocardium or the pericardium, Warthin (4) demonstrating microscopic lesions characteristic of spirochete localization in all of his postmortems on syphilitics. Brooks (5) found the pericardium involved in fifty-six per cent. of his cases postmortem and the endocardium in seventy-four per cent. Of the latter the aortic value alone was affected in fifteen per cent. and in thirty-four per cent. both the aortic and the mitral valves were involved, while in none was the mitral valve alone the seat of the process.

The symptomatology of syphilis of the heart does not differ as a rule from the symptomatology of cardiac disease due to other causes. Sachs (6) states that in syphilitic aortic insufficiency the left ventricle is not so enlarged as in this condition due to other causes, and therefore the capillary pulse and double sound over the crurales (Duroziez's symptom) are not so marked. Anders (7) has also observed that there is a more decided arrhythmia in cases of syphilitic aortic incompetency than in those of other etiology. It should also be remembered that statistical studies have shown syphilis to be the most frequent cause of aortic insufficiency.

Therefore, the diagnosis will depend largely upon the history, which when negative is of little value, the presence or absence of other manifestations of syphilis, the laboratory evidence and therapeutic tests. It must be understood that the presence of cardiac disease in an individual undoubtedly syphilitic, both clinically and from a laboratory viewpoint, does not prove the heart condition to be due to syphilis. The improvement of the cardiac symptoms under antisyphilitic treatment will, however, be very strong presumptive evidence that such is the case.

Many cases of disease of the various portions of the respiratory system, especially of the larynx and lungs, have been erroneously diagnosed when in truth the etiological factor was the spirocheta pallidum. Chancre of the larynx is most rare, but has been described (8). The syphilomycodermata, particularly the erosive papular lesions, the socalled mucous patches, are of course frequently located on the mucous membrane of the larynx, and when occurring as the only symptom of syphilis are often mistaken for some other condition. Gummata of the larynx have often been diagnosed as tuberculosis or carcinoma.

Syphilis of the lungs is now recognized as a not infrequent pathological entity, and unless the physician be on his guard he will mistake this condition for tuberculosis. In the latter, however, the apex is more frequently involved than in syphilis, the process is more often bilateral, nightsweats are more common and the cachexia is usually more marked. The absence of tubercle bacilli from the sputum over long periods of time or in marked cases will be suggestive of syphilis, and of course the finding of spirochetes would be positive evidence. A positive Wassermann would be strong presumptive evidence of syphilis, while the improvement under antisyphilitic treatment would be almost conclusive. Finally, it must be remembered that pulmonary syphilis and tuberculosis of the lungs not infrequently exist together.

The mouth and pharynx need only be mentioned to point out that syphilitic lesions of these localities are similar to such lesions in the larynx and need the same care in differentiation. Syphilis of the esophagus is a most rare condition, although Wile (9) is of the opinion that it is not so infrequent as the meagre literature on the subject would seem to indicate. The principal condition for which syphilis of the esophagus may be mistaken is carcinoma. The latter, as a rule, occurs later in life than syphilis, is of more rapid development, causes more cachexia, usually is more painful, more frequently provokes emesis and hematemesis and is more common in the lower portion of the esophagus than the upper. The location and extent of the lesion is determined by the x ray, while the Wassermann test is valuable in establishing the presence or absence of syphilis.

As with syphilis of the lungs, so with syphilis of the stomach, we are coming to the realization that it is not rare. Four types of involvement of this viscus are now recognized, namely, acute syphilitic gastritis, chronic syphilitic gastrititis, submucous gummata and ulcerating gummata.

The diagnosis of acute gastritis occurring early in the course of syphilis, as well as the later chronic gastritis, especially in the absence of other manifestations of the disease, may be attended with the utmost difficulty. However, as in any visceropathy, a Wassermann test should be performed, which if positive would indicate antisyphilitic treatment, and improvement of the gastric symptoms would confirm the diagnosis.

Submucous gummata of the stomach, which have not ulcerated, cannot be differentiated, clinically, from other tumors of this viscus. The history of syphilis, or other manifestations of the disease, including a positive Wassermann, would be strongly suggestive. While not distinctive of gummata a röntgenogram would be of the utmost value in locating the tumor in the stomach.

Ulcerating gumma of the stomach may be mistaken for simple ulcer or gastric carcinoma, and in some cases a positive diagnosis cannot be made. The pain of ulcerating gumma is probably not so severe or regular as that observed in simple ulcer and possibly is not so dependent upon the ingestion of food. Hemorrhagé also, while sometimes noted, does not occur as often as in simple ulcer and may not be so severe. Diminution or absence of hydrochloric acid is the rule in syphilis, while in simple ulcer hyperchlorhydria is more frequent.

In gastric carcinoma the development of the condition is more rapid, the hemorrhage is more frequent, emaciation more marked, and pain and vomiting more constant than in syphilis. The gastric analysis is also very similar except that lactic acid is not so frequently found in syphilis as in carcinoma.

It must be said, in conclusion, that the diagnosis of all types of gastric syphilis may not be made during life, although the improvement of the condition under specific therapy would be most significant, and the final test must rest on the postmortem findings, including, of course, the histological picture, and better still the demonstration of spirochetes.

The incidence of syphilis of the intestine is difficult to determine. However, most writers on the subject agree that it is of rare occurrence. Nevertheless, I should like to venture the opinion that it is more frequent than one would be led to suspect in view of the comparatively few references to the subject found in the literature, and if all the cases with symptoms referable to intestinal disease were fully investigated, an appreciable percentage would be found of syphilitic origin.

The pathology of syphilis of the intestine is similar to that of the stomach, that is, four types are observed, an acute and a chronic syphilitic enteritis, submucous gummata and ulcerating gummata.

Acute syphilitic enteritis usually occurs early in the course of the disease when other manifestations of syphilis are marked, so a diagnosis should be easy.

The chronic type is more difficult as it may occur independent of any outward manifestation of the disease. However, if the clinician keeps syphilis constantly in mind errors should be comparatively infrequent.

Submucous gummata, if of sufficient size to be palpated, must be differentiated from tumors of other types and this can only be accomplished by the presence of other symptoms of syphilis, laboratory procedures, and the result of specific therapy.

Ulcerating gummata are to be differentiated from intestinal ulcers of other etiology, from carcinoma, if in the colon, from amebic dysentery, and if in the rectum from tuberculosis. To a large extent this must be done by careful examination for other evidences of syphilis, laboratory procedures and the result of antisyphilitic treatment.

Syphilis usually occurs earlier in life than does carcinoma and the symptoms extend over a longer period of time. In amebic dysentery the finding of the entameba histolytica will be conclusive. Tuberculosis can usually be excluded by the absence of other evidences of the disease both upon clinical examination and by the use of the röntgen ray.

Involvement of the liver is the most frequent of all syphilopathies, so it behooves the physician when dealing with any liver abnormality to consider syphilis as at least a possible etiological factor.

Icterus gravis syphiliticus, the most serious liver condition due to syphilis and which in reality is an acute yellow atrophy, should be distinguished from this condition due to other causes. There is little in the clinical findings by which to differentiate the syphilitic from the nonsyphilitic, except possibly in the former the onset is usually not quite so sudden as in the latter, although the onset may be very sudden in the luetic type. The importance of always having syphilis in mind when making a diagnosis of any visceropathy is probably no better illustrated than in the condition under discussion, for the prognosis of icterus gravis syphiliticus is far from hopeless, while death is always the outcome of acute yellow atrophy due to other etiology.

There is also an early mild jaundice in syphilis which does not differ symptomatically from simple catarrhal jaundice and which is seen in about one half of one per cent. of all cases of syphilis. The importance of not overlooking syphilis in this condition is selfevident. Syphilitic cirrhosis of the liver is also a well recognized condition and must be differentiated from other types of liver cirrhosis.

Diseases of the spleen so rarely cause clinical symptoms, particularly subjective symptoms directly referable to that organ, that its abnormalities are often overlooked. However, the spleen is often found enlarged in the course of a routine physical examination and occasionally pain in the left side due to splenic enlargement may be the chief cause of complaint, so it is well to remember that palpable hypertrophy of this organ occurs in over one third of all cases of early syphilis.

Clinical syphilis of the pancreas is very rare but syphilis of this organ should be thought of in cases of glycosuria, in tumor of the head of the pancreas, especially in those without cachexia, in cases showing fatty stool, in abdominal pain of unknown etiology and in cases of icterus.

Of the endocrine glands the most important in the present study of unsuspected syphilis is probably the thyroid, although syphilis of the thyroid is a most rare condition. In most of the thirty recorded cases there have been no symptoms. However, in the case reported by me (10) in 1917 there was tachycardia, exophthalmia and albuminuria. In cases of Addison's disease the possibility of syphilis of the adrenals should always be thought of, and in glycosuria, giantism, acromegaly and other evident pituitary disorder syphilis of this gland should be considered.

Of the genitourinary organs, aside from the external genitalia of both sexes, the testicle is probably most frequently attacked by syphilis. Warthin (11) found varying degrees of atrophy and fibrosis of the testes in all cases of syphilis in the male which came to the autopsy table at Ann Arbor. The clinical recognition of syphilis of the testicle, however, is less frequent, but in all cases of swelling and tumors of this organ lues should be kept in mind.

Syphilis of the prostate is a rare condition. In 1920 I (12) reported a case and critically reviewed the literature, finding mention of only twenty-four cases purporting to be syphilis of this gland. Of these only twelve could be accepted as undoubted prostatic syphilis. Nevertheless, it seems that tumors of the prostate should be looked upon as possibly luetic until shown to be otherwise.

The comparative frequency of early syphilitic lesions of the cervix has been called to the attention of the profession by Gellhorn and Ehrenfest (13), so erosive and ulcerating lesions of this location should be looked upon as possibly syphilitic. Spirochetes can usually be found in these lesions, and the Wassermann is generally positive.

Cauliflower growths which simulate carcinoma may be gummatous, so the clinician should not be too sure that all such growths are malignant. Microscopic examination of a section of the tumor is the only sure way of making a diagnosis.

Syphilis of the body of the uterus, the Fallopian tubes and the ovaries need only be mentioned to point out that according to Gellhorn and Ehrenfest with the single exception of a gummatous endometritis observed by Hoffmann (14) no authentic cases of involvement of these organs have been reported.

Syphilis must be looked upon as a possible etiological factor in bladder disease, although it is comparatively rarely recognized. In 1919 I (15) reported a personal observation and reviewed the literature, finding mention of only eighty-four cases, of which only fifty-eight could be accepted as authentic. Since that time a few additional cases have been reported (16). There is nothing pathognomonic in the symptoms of vesical syphilis, but cases of hematuria and pollakiuria should be looked upon with suspicion until other etiology than syphilis be proved.

Luetic kidney disease is now a well established clinical fact. A transient albuminuria occurs frequently in the course of syphilis and is usually of little significance. However, if it persists without proper treatment a chronic nephritis may develop.

Acute syphilitic nephritis is a comparatively common condition and quite a number of cases have been reported in recent years. It differs little from acute nephritis due to other causes, and lues should certainly be considered in all cases where other etiology is not obvious. Munk (17) called attention to the presence of lipoids in the urine observed as fine droplets or in packets which are doubly refractive through a Nichols polariscope. These droplets are found more abundantly in the urine of syphilitic nephritis than in that of nonsyphilitics.

Syphilis of the breast, aside from chancre of the nipple and the syphilodermata, is a rare condition. It, however, does occur both as a diffuse swelling and as circumscribed gummata. That mistakes in the diagnosis of tumors of the breast may happen was well illustrated by the case I (18) reported some years ago. This patient, a woman whose husband had had syphilis three years before their marriage, came to me complaining of a lump in the breast, which in spite of a strongly positive Wassermann had been diagnosed as cancer and an operation advised. She was placed upon antiluetic treatment and in six weeks' time the tumor had decreased to half its former size.

The possible etiological relationship to disease of the bones and joints must always be kept in mind, and all cases in which other causes cannot be found be thoroughly investigated.

Syphilis of the nervous system is such a broad subject that it is only possible to touch upon its relationship to the present study. The importance of thinking of syphilis in practically all neurological and psychiatric cases is readily understood when it is remembered that about twenty-five per cent. of nearly four thousand cases admitted to the wards of the New York Neurological Institute were found to be suffering with disease of the nervous system and that had its origin in syphilis (19). Of course the investigation of any neurological problem, when a syphilitic etiology is suspected, is not complete without a thorough examination of the spinal fluid.

Diseases of the eye constitute many important problems in diagnosis and syphilis as an etiologic factor must often be considered. According to various authorities iritis occurs in from three to six per cent. of all syphilitics and constitutes from twenty-five to seventy-five per cent. of all cases of iritis.

Alexander (20) states that in eight per cent. of all syphilitics retinitis develops, although most authorities consider it less frequent. Syphilis of the other portions of the eye is more rare but should not be overlooked.

The object of the examination of a patient is diagnosis, to determine whether or not a pathological condition exists and if so, to determine its nature, and he who leaves a stone unturned is remiss in his duty. Therefore the plea is made that all examinations be so conducted that the existence of syphilis will never be overlooked.

In conclusion, may I offer the following epigram: Let syphilis be the lodestone of your diagnosis, the polar star of your suspicions, for this ubiquitous disease may mimic any known malady, may attack the prince and the pauper alike, and may invade any tissue or organ of the body.

The author's references will appear in his reprints.

Results in the Treatment of Syphilis

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Having been impressed by the inadequacy of many of the reports of cures of syphilis, dependent as they are on one or two negative Wassermann reactions obtained after too brief a period, I have gone over all the cases treated in the Department of Syphilology of the New York Hospital between January 1, 1915, and January 1, 1922, a total of 1,676 cases, and selected those that have been under observation for two or more years. From these I have omitted chronic cases giving distinct proof of involvement of the nervous system, whether the diagnosis was based on physical signs, on an examination of the spinal fluid, or on both. Such cases are in a class apart, as they usually have to be treated intraspinously. I say chronic cases of involvement of the nervous system advisedly, for early involvement of the nervous system, from which the patient makes a complete recovery, is rather frequent—the socalled parasyphilides are the result of smouldering syphilis in the central nervous system which has existed from early in the infection.

Fordyce says that twenty-five per cent. of his cases of secondary syphilis show positive spinal fluids (1). As only about ten per cent. of all cases show clinical evidence of involvement of the nervous system, it would seem that in some cases of early nervous syphilis recovery takes place spontaneously or the disease remains quiescent. This is known to be true from direct observation in individual instances. It is to be remembered in regard to Fordyce's statistics, however, that patients suspected of having central nervous involvement, are especially apt to be referred to his clinic by other physicians. On the whole our results, figured in terms of permanently negative Wassermann reactions, are rather disappointing, but it is to be remembered that we are treating sick people and not fighting blood reactions entirely. Most patients for all practical purposes except propagation of the species are cured. It is difficult to say surely what patients are so far cured as to be able to marry with safety but that the sum of human misery is diminished and the spread of the disease lessened is beyond dispute.

What constitutes a cure? Is one negative Wassermann proof of cure? It is proof of nothing at all. On the contrary it is often a distinct disadvantage, in that it is likely to be given undue weight by both patient and physician. While repeated negative reactions obtained over a considerable period are some indication that the disease is greatly limited or perhaps eradicated, this circumstance is not to be regarded as absolute proof that particular individual is free to marry safe from the fear of begetting syphilitic offspring. While a negative spinal fluid is a further indication of the probability of cure and one of great value, it is not absolute proof, as I can cite cases to show that a relapse occurred after a considerable period as indicated by recurrent positive reactions in the blood, when the spinal fluid was negative. That many patients do marry and their consorts remain healthy, or, if they do become infected, do not pass on the disease to their children, is proved by the serological and physical findings in scores of adults and children in this clinic. By interdicting marriage to all syphilitics many useful and healthy members will be lost to society; yet it would seem that in the present state of our knowledge it is the only safe advice to give, if we would approximate elimination of this scourage.

The preparation of the accompanying tables was accomplished with the assistance of the late Dr. Walter Reynolds. They required an amount of work altogether out of proportion to the information obtained, and yet the findings are not devoid of significance. The results in secondary cases are encouraging while those in tertiary are rather more promising than I had expected to find. Congenital cases are the most difficult to influence serologically, as a glance at the tables will show. Among tertiary cases, omitting parasyphilis from our present discussion, those with extensive lesions of the heart and aorta and those with evident involvement of the liver are especially obstinate.

Dr. Newcomer, of the Pennsylvania Hospital, thinks that the length of time a patient is under treatment rather than the size of the doses administered is of importance (2). Professor Irvine, of the University of Minnesota, says that even mediocre treatment, if given over a period of years, will do much for the average case, whereas even the best treatment, if applied for less than six months, can do little (3). These observations have been confirmed by our experience.

A recent paper by Wade H. Brown and Louise Pearce, of the Rockefeller Institute, on the Defensive Reactions of Animals Infected with Spirocheta pallida (4) emphasizes the fact that the defensive mechanisms of the body are directed, on the one hand, to destruction of the parasite, and on the other, to neutralization of its toxic and other harmful effects; that while the lesions are often prevented or repaired entirely, the parasite is never wholly eradicated; that an experimental animal once syphilitic is always so and is liable to relapses which, in general, tend to become less and less frequent. That the severity of subsequent lesions is in inverse ratio to the disturbance at the site of inoculation; that when a rabbit is inoculated with syphilis, one of three phenomena occurs; 1, generalized disease with involvement of any or most tissues; 2, the disease may be circumscribed to the site of inoculation and the adjacent lymph nodes, and 3, that there may be infection without a sign of a lesion at the point of injection of the virus and little or no clinical evidence of the existence of such.

They stress the orderly progression of events in the evolution of the malady, as shown by the original outbreak of symptoms, then quiescence, recrudescence on one or more occasions, and gradual subsidence, never complete elimination of the infection.

Some of these experiments appear to have their analogues in man, as the frequent occurrence of vascular syphilis and the parasyphilides without history of infection go to show. In many of these cases the original sore and following secondaries were so insignificant as to have escaped notice. Severe cutaneous lesions, on the other hand, are less likely to be followed by parasyphilides.

Another paper, which bears on the prognosis and which has attracted much attention as well as adverse criticism, is by Professor Warthin, of the University of Michigan. He states that forty per cent. of his autopsy material presented microscopical evidence of syphilitic infection, as shown by infiltrations of lymphocytes and plasma cells in different instances in pretty much all organs; as the nervous system, the heart, the aorta, the pulmonary artery, the peripheral arteries, pancreas, adrenal, glands, liver, testes, lung, spleen, kidney, genital apparatus, lymph nodes and bone marrow (5).

That the patient had been thoroughly treated and had a negative Wassermann reaction, Warthin considered no guaranty of the eradication of the parasite. He demonstrated the organism in such a large proportion of his cases (seventy-five out of three hundred) as to make the specific syphilitic nature of these lesions certain. While many of them tend to recovery, all are never eradicated. According to this author an individual once infected with syphilis is always thereafter a spirochete carrier, but these organisms may be as harmless as the streptococci of the mouth.

Professor Warthin's findings have been attacked on several grounds, among which the following are to be noted:

1. That it has never been proved that there are not other diseases in human beings caused by spirochetes that become localized. The answer to this is that we are going contrary to our experience in making such an assumption.
2. That having found spirochetes in seventy-five out of three hundred cases where there were small cell infiltrations, he concluded that all the remaining similar lesions were chronic syphilis. It would seem at least probable that many of them were due to other causes.
3. That there is no evidence that these patients received sufficient treatment.

Engman and Eberson (6) found the organisms in the lymph nodes in three out of fourteen cases of latent lues and in two out of seventeen specimens of seminal fluid by inoculation in rabbits. One specimen of semen was from a man who had been infected thirteen years previously and who had been treated with two doses of salvarsan and pills for three years.

Arzt and Kerl (8) found spirochetes in the scar of a chancre of a patient who had been clinically and serologically well for eight years.

The following statistics from Williams (9) of Johns Hopkins University, will answer a question that is often asked, as to the advisability of treating syphilitic mothers rather than producing an abortion: No treatment of the positive mother results in 48.5 per cent. syphilitic infants; inefficient treatment of the positive mother results in 33.2 per cent. syphilitic infants; good treatment of the positive mother results in 6.4 per cent. syphilitic infants.

Here I mention in passing the interesting efforts especially sponsored by Levaditi and Marie to prove that there exist two varieties of treponema, a dermatotropic and a neurotropic. The evidence advanced is striking but, as I can refer to many patients in my clinic that have involvement of the heart and arteries and some that have unmistakable evidence of gumma of the liver who are victims of parasyphilis, it would seem that either the difference in the varieties is not absolute or that some unfortunates are the hosts of both varieties. Different defensive mechanisms in the hosts may be quite as responsible for the ultimate nature of the disease as differences in the varieties of treponema. I refer you again to the rabbits in which the severity of the systemic disease is in inverse proportion to that of the primary lesion with the same culture of treponema. The Utopian era of serotherapy in this disease has not arrived yet. The idea of this possibility is not new and was suggested in part by the fact that defensive substances exist in certain animals. Horses and cattle, for instance, are immune, while rabbits and monkeys usually recover, symptomatically at least, after a comparatively brief period.

Eminent authorities have long recognized that measures directed towards improving the condition of the host tend to limit the ravages of the causative organism, so that tonics and general hygienic measures are important.

Of the two specifics used in treatment of syphilis, arsenicals have a tendency to attack the bloodvessels and liver, while mercurials are especially harmful to the kidneys. Whenever the kidneys are diseased mercury must be given with care. In some patients it causes marked anemia and has to be discontinued. The only contraindications to the use of arsphenamine are degeneration of the liver and dermatitis exfoliativa. If a patient has ever shown evidence of degeneration of the liver as evidenced by jaundice and protracted vomiting after the administration of this drug, it should be given with caution in future. We have regarded dermatitis exfoliativa as an absolute contraindication to the intravenous employment of arsenicals, although the small doses given intraspinously are harmless. Iodide of potash is not spirocheticidal. It tends to cause degeneration and absorption of the small celled infiltrations characteristic of syphilis.

ROUTINE TREATMENT.

Formerly our routine was to give six doses of arsphenamine followed by twenty intramuscular injections of salicylate of mercury. At present we give eight intravenous injections at weekly intervals of arsphenamine or neoarsphenamine followed by ten or twelve injections of mercury. In chronic cases we begin with a dose of arsphenamine or neoarsphenamine of rather small size (0.3 gm. of arsphenamine or 0.45 gm. of neoarsphenamine) and increase gradually to 0.5 of arsphenamine or 0.75 gm. of neoarsphenamine. Only when we are endeavoring to abort the disease in the primary stage do we employ maximum doses in the beginning of treatment and shorter intervals between doses.

Weight, age and sex have a bearing on the size of the dose. Lately we have acquired such confidence in the safety of neoarsphenamine that we are employing larger doses. In latent cases, especially when the nervous system is involved, several injections of mercury should be given before beginning the arsenicals to avoid the Herxheimer reaction. We prefer neoarsphenamine because of the simplicity of technic, the absence of reactions, the low toxicity, and the speed with which it can be given in a clinic.

Two months after the completion of the course of arsphenamine and mercury, we take a Wassermann reaction and whether it is positive or negative repeat the medication just as before. If the next Wassermann reaction is negative after two months, we take another after two months more; if this is negative, we keep the patient under observation and try to get a lumbar puncture. If the Wassermann reaction is positive on the other hand, we begin the course again, and proceed as before.

For brevity in the tables the reports of Wassermann reactions are noted as positive, doubtful and negative. Four plus and three plus are regarded as positive; two plus, one plus and plus minus are regarded as positive when the reaction had previously been positive. Only those cases are regarded as finally negative in these tables that gave two or more negative reactions over an appreciable interval, usually a year or more. N in the column marked Final Result means cured. P means uncured while D— means probably cured, and D+ probably uncured. The term cured is to be taken with reservation and may mean only that the disease is so far controlled that the organism remains relatively inactive and the Wassermann reaction has a tendency to remain negative.

TABLE I.

Stage	Total cases	Cured	Probably cured	Uncured	Probably uncured	Total Percentage Probably cured
Secondary	32	21	3	7	1	75
Tertiary	44	19	6	17	2	56.8
Congenital	15	4	1	10	..	33.3

TABLE II.

Stage of syphilis		Males	Females	Total	Average age	Average duration of observation in months	Average total quantity of arsph. 3 Neo.=2 Ars. in decigrams	Average number of injections. of Arsphenamine	Percentage of probably cured (=N.)
32 Secondary	N...	11	10	21	27	44	46.2	14.3	75
	D...	3	1	4	28	37	66.5	16.8	
	P...	4	3	7	29	40	84	20	
44 Tertiary	N...	7	12	19	33	48	31.2	8.8	56.8
	D...	4	4	8	36	36	46.8	11.8	
	P...	11	6	17	35	41.2	82.1	20.4	
15 Congenital......									33.3
	P. D. N...	6	9	15	11	44.3	25.1	14	

These ninety cases were selected from 1,676 that were treated at this clinic because they had been under observation for some time rather than because they received ideal treatment.

The author's references will appear in his reprints.

The Surgical Kidney

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The question when to operate and, what is of equal importance, when not to operate, is always a serious and often a puzzling one. It is true that destruction or removal of even a considerable amount of renal tissue is well tolerated because the normal supply of renal tissue is superabundant—the amount of parenchymatous tissue present in two thirds of a healthy kidney is sufficient to carry on the normal life processes imposed on the kidneys. Still, removal of a kidney leaves but one, and a pathological condition which is of little significance in a person with two kidneys, such as the passage or attempted passage of a renal calculus, becomes of great concern in a patient with a single kidney. Of lesser importance than nephrectomy is the scar tissue which forms after operation on the parenchymatous tissue of the kidney or after decapsulation of the kidney, though this is injurious also and should discourage operation unless the indications for it are clear.

The indications for operation on the kidney are the same as those for operations on other organs, viz., to repair injury from trauma, as rupture of the kidney, to evacuate pus, to remove tumors or large cysts, to remove injurious foreign bodies (calculi and others) and to relieve tension within the organ. Other indications for operation on the kidneys are to remove a tuberculous kidney, to replace a prolapsed organ, for plastic operation on the renal pelvis, etc.; also to overcome anuria, either reflex or direct.

Let us first take up those conditions where indications for operation are overpowering and those in which the contraindications are slight or nil.

Traumatic injury of the kidney.—The wound may open externally or be subcutaneous. An external wound is produced by a stab, a bullet or other missile. It is clear that the walls of large external wounds must be drawn together, that hemorrhage must be stopped, and if the kidney is so injured that urine is discharged externally with the blood the wound must be laid open and the kidney sutured. Drainage must be provided.

Subcutaneous injury to the kidney is produced usually by indirect violence. The patient falls, perhaps on the buttocks, and the kidney is jammed against the lower rib. It may be torn, perhaps into the pelvis; it may be torn entirely across or pulped. In all cases of severe injury to the kidney shock is common. This may be prompt or it may be delayed, in some cases, as long as twenty-four hours; and powerful stimulant may not be administered for fear of increasing the hemorrhage. We must always bear in mind that the same force which has caused injury to the kidney may have injured other organs and structures also.

The symptoms of injury to the kidney, aside from shock, are pain, tumor and hematuria. The pain may be an ache in the loin, or a socalled kidney pain radiating along the ureter with retraction of the testicle of that side. Of course, pain due to accompanying injury of other structures may be present. Tumor depends on the amount of extravasation about the kidney. Hematuria occurs in all cases where the injury is not too far from the renal pelvis; the hematuria, which may be delayed for some time, is continuous or intermittent. Oliguria or anuria is commonly present the first few hours after injury because of excessive irritation of the injured kidney with reflex inhibition of the other kidney; and this is followed by a temporary polyuria. Sepsis followed in some cases (about twelve per cent.) chiefly where instruments, such as catheters have been used. Secondary hemorrhage may follow separation of a slough.

Operative measures should be used only when necessary, viz., to stop hemorrhage, to drain infected areas, and to remove local irritation which reflexly causes anuria.

Prolapsed kidney.—The question of sewing a displaced kidney into the normal position requires more consideration than operation on a wounded kidney for the following reasons: In perhaps the majority of cases of prolapsed or floating kidney no subjective symptoms are present. Since no useful purpose is served by operation on these, nephropexy is out of place. In other patients symptoms of various kinds are found, due directly or indirectly to the nephroptosis. In some, Dietl's crisis occurs. These are attacks of intense pain caused by twisting of the kidney on its pedicle with resulting intense congestion of the organ; these pains are most commonly felt in the epigastrium. Shock is present with the intense pain, and after this pain is alleviated an ache is likely to remain for a few days.

Some patients present symptoms due to pressure of the displaced kidney on neighboring organs. Dilatation of the stomach may be present as a result of pressure on the fixed part of the duodenum, or jaundice may occur from constriction of the bile duct by traction on tissues which cross it.

Still another group of patients show reflex symptoms such as pain along the genitocrural and other nerves, hypochondria, gastrointestinal catarrh, emaciation, and neurasthenic symptoms. Symptoms, aside from those referred to the kidney, which are suggestive of nephroptosis, are disorders of digestion with repeated gastric crises without discernible cause, or attacks of what appear to be renal colic without the passage of a stone or the presence of a pyelonephrosis.

Supporting the kidney by a snugly fitting jersey or an abdominal belt will often give relief. Before deciding on operation in rebellious cases we should take into consideration the fact that in some instances the symptoms are not benefited by it.

To relieve tension.—A condition of the kidney in which operative procedure comes into question is, broadly, to relieve tension within the kidney capsule, as in acute nephritis—that of scarlet fever for instance, and in chronic kidney diseases where the organ is considerably enlarged and its tissues are compressed by the tough capsula propria. In the acute form of nephritis, anuria is a clear indication for decapsulation. The operation here is best done under local anesthesia and the kidney should be handled as little as possible. In the chronic renal conditions mentioned above, decapsulation will relieve tension within the organ and permit better function. In the latter cases where indication for operation is not so urgent, the fibrous tissue which will form, in time, and which will probably be thicker than the original capsula propria, constitutes an objection to the operation. As, however, this fibrous tissue is produced but very slowly, life may be made more comfortable in the meantime, and perhaps prolonged by the operation.

In some cases of what we still diagnose, clinically, as essential hematuria and in which we find, histologically, some form of nephritis, decapsulation may give fair results: where the bleeding is severe and can not be otherwise controlled this must be done.

Tumors of the kidney.—Tumors of the kidney give a clear indication for radical operation. Only about seven per cent. of renal tumors are found to be benign, and these, at least when they are large enough to be palpated, have a tendency to undergo malignant degeneration. The only contraindications for removal of the involved kidney are, 1, when metastasis has already occurred or the growth has spread so that it can no longer be removed; 2, when the second kidney is in such poor condition that it can not sustain life if the other kidney is removed, and 3, when the patient can not stand the shock of the operation or is expected to die shortly of some other irremediable disease. In the absence of contraindications, no other method of treatment should be considered. The prognosis in operation for malignant tumor of the kidney is grave but is improved if the radical intervention is early.

Renal tumors are found, chiefly, in children under five years of age and in adults over forty. In children the growth is sarcoma as a rule; in adults it is most commonly hypernephroma, less frequently cancer or mixed tumor, but as all are of the utmost gravity, no treatment should be considered but radical removal except where the prospect is hopeless for any other reason. The mere presence of the tumor—the irritation of the tissues by it and the pressure it exerts on the kidney structure, produces fibrosis about the tumor and a general chronic interstitial inflammation of that kidney. The second kidney may develop a chronic interstitial process from the irritation by the toxins of the morbid growth as they are eliminated. But these need not be considered in the question of treatment, for the indication for operation is already absolute, unless such intervention is useless because of complications.

Symptomatically we will group renal tumors into, a, those with hematuria; b, those with tumors; c, those which present both hematuria and tumor, and d, those in which the chief symptom is pain.

The principal symptoms of benign growths are produced by the presence of their mass—by their size and weight and the pressure they exert on neighboring organs. The drag of the heavy mass on its attachments or pressure by it on the back causes pain or lameness of the back; varicocele or edema may result from impingement on bloodvessels; and pressure on the gastrointestinal tract is followed, in time, by gastrointestinal disturbances, viz., distress after meals, nausea and vomiting, and constipation perhaps alternating with diarrhea. Blood is found but rarely in the urine. The tumor mass is palpable, and as in time a loss of weight ensues, a differential diagnosis from malignant growth is difficult.

Hematuria.—In adults this is present, sooner or later, in the vast majority of cases (235 of 257, Albarran) and is the first symptom noticed in about seventy per cent. In children it is found in sixteen per cent. of the cases. The hematuria of renal tumors comes and goes spontaneously, without regard to exertion, and at irregular intervals of weeks or months. The hemorrhage is more profuse than that in other kidney conditions, and generally becomes more plentiful and the attacks become more frequent. The amount of blood lost bears no relation to the size of the tumor and the blood is well mixed with the urine. Not infrequently wormlike clots are found; and if these are several inches long they can come from no other place than the ureters or urethra.

Tumor mass.—In adults this is the first symptom noticed in twenty per cent. to twenty-five per cent. of the patients and is found in almost eighty-five per cent. of the advanced cases. In children it is the first symptom found in a third of such patients and, in time, is found in almost every case. While the growth is yet small it is irregular, moves freely with respiration and can be ballotted; when large it forms a mass of considerable size in the loin, with the colon in front of it. In time it becomes fixed by adhesions. The mass may be rounded and smooth or nodular; it may feel firm and, if large, show areas of less resistance.

Pain.—Pain is a symptom, at some time or other, in forty to fifty per cent. of all cases of renal tumor. The pain has been described among the symptoms found with benign tumor. Tension within the tumor by congestion or hemorrhage into it gives a severe ache in the loin. Such an ache, that is affected neither by motion nor by change in the amount of hematuria and that is relieved only temporarily by medication, is characteristic of renal cancer. Neuralgia along various nerves, the intercostals, the sciatic, the spermatic with pain in the groin or testis, of the ovarian plexus with pain in the uterus and ovaries, or along the gastric and splanchic plexus with gastrointestinal pain, is due to involvement of these nerves. Neuralgia may be the first symptom of the tumor. Tenderness occurs with the pain.

Cachexia is usually a late symptom of the malignant growth. In a small number (eight per cent.) of these cases a specific remittent or intermittent fever, or an occasional attack of fever, is present and disappears with the removal of the growth.

Hypernephroma, the usual type of malignant tumor in adults has a chronic course with latent periods.

Tumors originating in the renal pelvis are rare, but growths springing from the kidney often project into the renal pelvis. With a large number of the growths originating at this point, we find calculi within the renal pelvis; it is probable that the local irritation produced by the calculi encourages the development of tumors. These growths are usually of the epithelial type, the great majority of which are simple papilloma and a small minority, epithelioma. The benign growths show a tendency to malignant degeneration and it is sometimes difficult to distinguish between the two even by the microscope.

Tumors which by their location obstruct the ureter, whether they originate in the pelvis, the kidney or the upper part of the ureter, give symptoms similar to those of renal tumor plus those of obstruction to the flow of urine at or near the pelvis, the latter being renal colic with pain in the kidney region and enlargement of the kidney.

Cystoscopy will often show the growth projecting from the ureteral orifice and the ureteral catheter passed to the renal pelvis will usually withdraw bloody urine and may dislodge pieces of the villous growth.

Early and radical surgical intervention is the only form of treatment to be considered here as the simple growths tend to become malignant and the malignant, to recur after removal. If the growth is restricted to the lower part of the ureter, that is removed and the distal end is implanted into the bladder. If the renal pelvis is affected nephrectomy must be done and if the neighboring part of the ureter is also involved the tube is resected as low as possible. In spite of such treatment the prognosis is grave.

Cysts of the kidney sometimes require operative interference. Of the several varieties of cysts found, some may be dismissed with a few words. Polycystic or cystic degeneration of the kidney is a congenital condition in which the organ consists of a mass of cysts of different sizes, from minute to that of a cherry. When the kidneys are not too large to interfere, mechanically, with the birth of the child, the condition gives the symptoms of interstitial nephritis; in a quarter of the cases we also find hematuria; and many complain of a feeling of weight in the loins and show there a tumor, irregularly embossed.

Nephritic cysts differ from the above in that they are small cysts in the urinary tubules, formed above constrictions which are the result of an interstitial nephritis. The cysts are generally found in the cortex and project beneath the kidney capsule. Symptoms of chronic interstitial nephritis are present. In both cystic degeneration and nephritic cysts it is useless to remove a kidney or part of one because there would be a loss of renal tissue which, while not of the best, yet functions to a certain extent and can not well be spared.

The kidney occasionally presents serous cysts which may be as large as the head of a child and require different treatment from the above. These cysts are situated on the surface of the kidney and their removal does away with a harmful or at best a useless mass without destroying parenchymatous renal tissue. We may attempt to differentiate the cyst from a hydronephrosis by passing a ureteral catheter into the renal pelvis. If the eye of the catheter is at the dependent part of the renal pelvis the hydronephrosis will be evacuated and the tumor will disappear. If the eye of the catheter is in some calyx, only a little of the fluid will pass off. A serous cyst has no connection with the pelvis of the kidney and can not be affected by the catheterization.

Hydatid cysts of the kidney give symptoms somewhat similar to those of large serous cysts—symptoms of the mass that is connected with the kidney. Hydatid fremitus is rare. In time the cysts burst, usually into the renal pelvis, sometimes into the gastrointestinal tract or the lungs or into several of these organs. These cysts are distinguished from hydronephrosis in the same way as the large serous cysts, but the exact diagnosis may be made only with the appearance of the daughter cysts in the discharge from the ruptured cyst.

The serous cyst may be removed bodily together with the adjacent kidney tissue, or the redundant cyst wall is cut away, the rest of the surface is cauterized with pure carbolic which is neutralized with alcohol, and the wound drained. For hydatid cysts a nephrotomy with a thorough washing of the cyst wall with tincture of iodine or some other antiseptic solution will often suffice. The washing is repeated daily for several days, the drain is then removed and the wound allowed to heal.

Hydronephrosis is a distention of the kidney pelvis and the adjacent part of the urinary canal by urine that is retained above some obstruction in the canal. The obstruction may be congenital or acquired, complete or incomplete, and its onset may be gradual or sudden. It may be permanently or intermittently closed. Obstruction in or above a ureter causes a unilateral dilatation; with the obstruction below the ureters we may expect a bilateral hydronephrosis.

If the obstruction is sudden and complete the tension within the pelvis is great; the organ becomes intensely congested, and as it stretches but little under the sudden tension the parenchyma atrophies rapidly as a result of the great pressure. If the obstruction is incomplete, some urine is passed, the tension is less and the atrophy of the parenchyma slower; the sac is stretched more gradually but to a much greater extent till it may hold five, six or more gallons of fluid. With intermittent obstruction the results are somewhat similar to those in the incomplete form. Kidney tissue is very resistant and may function to a certain extent when the passage is reopened.

The symptoms vary with the form of the hydronephrosis. When the obstruction is sudden and complete, severe pain is felt at the region of the enlarged and tender kidney. If the obstruction is removed after some hours or days the symptoms are relieved suddenly with a profuse discharge of urine.

In forms which develop more slowly, where the obstruction is incomplete, subjective symptoms may be absent or a dull ache at the costovertebral junction is complained of. In time tumor develops, and this is either constant or intermittent. The tumor present in the chronic form of hydronephrosis is in the loin or, if large enough, extends beyond it; it is smooth, elastic, insensitive and freely movable unless it is so large that it fills the loin.

A closed hydronephrosis is impervious to a ureteral catheter. A partial obstruction may be passed by manipulation; the passage of the catheter is followed by a gush of urine or by hurried drops; and pressure on the mass will accelerate the flow. When the hydronephrosis is emptied the tumor disappears.

Small dilatations of the renal pelvis are detected by pyelography. The cavity is filled gently, through the ureteral catheter, with some solution impervious to the x ray and a röntgen plate made. The fluid must be injected carefully and evacuated as soon as slight pains appear in the loin.

The prognosis of hydronephrosis depends on whether the condition is unilateral or bilateral, on the possibility of removal of the obstruction, on the possibility of repair of the dilatation in the canal so that no dependent pouches will remain in which urine may collect, and on the condition of the kidneys. The treatment depends on the abnormal conditions present. The obstruction must be removed and defects of drainage must be repaired, by plastic operations, if necessary.

We now come to more debatable ground in the field of kidney surgery, renal calculi. There is no question as to the undesirability of carrying about a stone in one's kidney and that the presence of the stone is at best more or less injurious. On the other hand are to be considered the possibility of ridding the patient of the calculi without operation, the possibility of the stone remaining latent in so far as acute symptoms are concerned, and the probable damage which will be done by the retained stone as compared to the damage which must follow operation on the kidney.

The ill effects of the presence of the calculus may be divided into, a, injury to the kidney; b, injury to other organs or tissues; c, dangers resulting from the presence of the calculus in the tissue, and d, disagreeable symptoms.

The irritation produced by the presence of the stone results in a fibrosis which spreads through the kidney to the capsule. When the fibrous tissue contracts the kidney becomes small and granular. The perinephric fat about a calculous kidney often increases in amount and its stroma becomes fibrous; then the fat invades the kidney at the hilum, spreads along the vessels and compresses, destroys and replaces the kidney tissue. These changes are of course slow.

With increasing disability of the calculous kidney, the second kidney undergoes compensatory hypertrophy. A less desirable change that may occur in the second kidney is a chronic interstitial fibrosis due, perhaps, to the same diathesis which produced the stone in the first kidney.

Obstruction of the urinary canal by the calculus will bring on a hydronephrosis. The amount of damage in such a case depends on the completeness and persistence of the obstruction, as was explained above. A single calyx may be obstructed with similar local results. The presence of calculi is undesirable for other reasons. Mechanical injury produced by them weakens the local resistance to infection. As a result pyelitis, pyelonephritis and other conditions set in more readily in a calculous kidney than in a normal one. Again, acute infectious fevers are accompanied by acute congestion of the kidneys. Such a process is more dangerous to organs that are already irritated and otherwise injured by a stone than to normal ones; and the ordinary oliguria so common at the onset of acute infectious diseases may progress to anuria, direct in the calculus kidney and reflex in the other. Such an occurrence is not common, however; autopsy in fatal cases almost always shows there has been severe disease in both kidneys.

Symptoms—The symptom which most urgently brings up the question of operation is pain. A severe attack of renal colic is a disagreeable experience and, if this is frequently repeated, may become almost intolerable. Pain of some kind is present in about seventy per cent. of the patients with renal stone; characteristic renal colic is found in some forty-three per cent.

The pain produced is not in proportion to the size of the calculus; quite the contrary. A large smooth stone or any stone that is immobile may give no pain at all or may be accompanied by a dull ache in a renal pain area—posteriorly at the costovertebral angle and anteriorly at a point an inch and a half below and internal to the tip of the ninth rib. The intense pain of renal colic is due to the passage or attempted passage of a stone through the ureter into the bladder, so a small, jagged stone may give excruciating pain while the calculus that is larger but smooth acts much more gently.

We must always remember that renal colic may be simulated by the pain resulting from any sudden obstruction in the urinary canal to the flow of urine, perhaps by the passage of a blood clot or a mass of debris. The increase of tension in a renal tumor, by hemorrhage into it, may give a similar pain.

The pain of renal colic begins in the loin at a renal pain area, shoots along the ureter to the external abdominal ring and may continue into the testicle of that side or into the point of the penis—in the female into the labia majora; it may be reflected along the sciatic nerve, down the anterior surface of the thigh or across the abdomen. When the pain is intense, symptoms of shock may be present, the abdomen is rigid and the thigh flexed. The urine passed after the colic may be bloodstained and may contain the calculus.

The calculus may be retained in the ureter, perhaps at some dilated point, without stopping the flow of urine and cause pain and tenderness there; if this occurs on the right side, it is at times mistaken for appendicitis.

In considering the advisability of operation for renal calculus, it would be best, perhaps, to begin with those groups of cases in which the indications for operation are imperative and leave the more doubtful for the last.

Calculous anuria demands operative interference unless indeed it is clear the patient will not survive the operation. Operation before the fourth day of anuria shows a mortality of twenty-five per cent., before the fifth day, 30.7 per cent., and before the sixth day 42.1 per cent. Spontaneous recovery occurs in from twenty-one to twenty-eight per cent. of cases, in some instances after ten days or more of anuria, but in none of these is the second kidney disorganized.

The anuria is due to a total obstruction of the flow of urine, whether by simultaneous blocking of both ureters, blocking of a common stem of both ureters or of a single ureter of a fused kidney; or one ureter may be blocked, while the second kidney is incapable or reflexly inhibited. Such inhibition may be partial or complete.

Hematuria is a symptom that is common with renal calculus; but it is not often of any intensity, differing in this from the type of hemorrhage common with renal tumors. In the infrequent cases where the hemorrhage is severe and can not be controlled, surgical intervention is necessary.

Pyuria is a common symptom and occurs where infection complicates the calculus. This will be considered later with renal infection.

Tumor.—Very large calculi, larger than a normal kidney, have been found, where the tissue has been largely destroyed. The discomfort of the weight of the mass may more than counterbalance the value of the little function left that kidney.

Next comes that group of cases in which attacks of severe renal colic are common and frequent. It is known that patients who pass small renal calculi frequently, and in spite of this show no large stone nor group of small calculi by the x ray, continue to pass small stones after operation. Cases of this type are therefore best treated by nonsurgical measures. If with frequent and severe attacks of renal colic, large masses of stone are shown by the x ray, operative interference is more reasonable. We should also take into consideration the fact that uric acid calculi are not shown by the x ray, as a rule.

The group where doubt as to the advisability of operation is greatest is that in which the symptoms are mild or very slight. The patient may feel a slight ache, at more or less infrequent intervals, along the path of the ureter and this disappears on lying down after some hours. In somewhat severer cases a hypodermic injection of morphine with atropine is advisable. In still other cases the patient complains only of a slight ache in the loin.

As already mentioned, objections to the presence of renal calculi even in cases with very mild symptoms are, a, the progressive damage to the renal parenchyma; b, the greater probability of infection of the kidney; c, the increased danger to the patient in case an acute infectious fever develops, and d, the possibility of obstruction by the stone with resulting hydronephrosis.

It seems to us that when symptoms are absent or very mild, the injury that is apt to be done to the renal tissue by the presence of the calculus is no worse than the damage which will be done by the operation. A small stone in the renal pelvis may be removed through an incision in the pelvis without injury to the renal parenchyma; but we may find astonishingly little damage histologically, after such a stone has been retained for years.

It is possible for renal calculus to develop in a patient with acute infectious fever, and the presence of the calculus may add to the seriousness of the disease. On the other hand, in a comparatively small number of all the patients with renal calculi, an acute infectious febrile disease may be expected to develop, and of those patients only a certain proportion are likely to suffer serious renal complications. We must therefore judge the sum of the increased danger which a small percentage of such patients with renal calculi will incur if they are not operated on, and the totality of danger which will attend operation on all patients with renal calculi and with no indication for operation except that under consideration.

Obstruction of the ureter with development of a hydronephrosis can be attended to promptly if it should occur.

For calculus impacted in the ureter, operation need not be rushed. The majority of such calculi—Braasch believes seventy-five per cent.—pass spontaneously if morphine is administered; and many of the others can be made to pass by intraureteral manipulation. Introduction of the ureteral catheter will stimulate contraction of the ureter and help expel the stone. Injection of sterile olive oil through the catheter will both lubricate the canal and stimulate the tube to contract. Two c. c. of a cocaine solution injected at the site of the calculus through the catheter will often enable us to pass the instrument above the stone, and injection of a few c. c. olive oil at that point, together with the anesthesia below the calculus, will facilitate the passage of the stone.

Renal calculi must be diagnosed from all other conditions which may present somewhat similar symptoms, viz., renal tuberculosis, renal tumor, nephroptosis, cystitis, gallstones and appendicitis. Diagnosis of the presence of renal calculi is insufficient. We must also ascertain the number and position of the stones, the presence or absence of renal infection and the functional capacity of both kidneys.

Renal infection gives profuse pyuria and bacteriuria; and urine procured from the individual kidneys will show if either or both kidneys are involved. The capacity of each kidney is estimated by making one or more functional tests.

Unfortunately not all calculi cast shadows on the röntgen plate, for example, uric acid stones. In cases where caseated lymph nodes lie near the ureter, these may be mistaken for calculi impacted in the ureter. X ray plates taken from different angles with an opaque catheter inserted into the ureter will show if the shadows are at the ureter, to either side, in front or behind the tube.

In case the x ray examination gives negative results and the symptoms are suggestive of kidney stone, the following hints will help: In calculus the pains are usually precipitated by jarring or motion; in all other conditions of the kidney with attacks of pain these are apt to appear spontaneously; with calculi the hemorrhage is apt to be scanty and is also brought on by motion; with tumor the hemorrhage is generally profuse, successive attacks become more profuse and come at shorter intervals; in tuberculosis of the kidney hematuria is spontaneous but the blood is scanty except in the rare instances where the ulcerated lesion is on the tip of one of the papillæ which are vascular; with calculi the urine shows excess of salts and no tubercle bacilli while in renal tuberculosis salts are not in excess and tubercle bacilli are found—perhaps only by animal inoculation; in nephroptosis the kidney is found displaced by bimanual examination and if necessary by pyelography.

Treatment.—The treatment for renal calculi may be prophylactic, medical and surgical. To know how to treat this condition properly it is necessary to understand the formation of urinary calculi.

These stones are composed of urinary salts which have been precipitated and are held together, in rather regular layers, by an irreversible colloid, about some nucleus. The nucleus may be any foreign body as a blood clot, a mass of pus, a tip off a broken catheter, or, in children, a crystal of ammonium urate with which the urinary tubules are filled in infancy. The salts most commonly found in urinary calculi are uric acid, calcium oxalate and phosphates.

The salts are derived from the foods ingested and from the metabolism of the body. In fact, the tissues of the body itself will furnish enough material to form large stones when metabolism is disturbed. It is therefore readily seen that change in diet which will diminish the intake of the offending salts is of little value when excessive production of such salts is present because of some metabolic disturbance. Improving the metabolism of the body by keeping the great ureaforming organ, the liver, in good order so that urea will be formed instead of uric acid, and by taking care that sufficient oxygen is supplied for purposes of oxidation, which presupposes good respiratory and circulatory organs and good blood, are of greater importance by far than curtailing or modifying the diet.

Some of the treatment used for urinary calculi is based on the following: The urine holds in solution more of certain salts than is soluble in water. This solvent power is due to various things; for example, earthy phosphates are soluble in acid and precipitate in alkaline urine, uric acid is more soluble in alkaline and precipitates in strongly acid urine, excess of uric acid is kept in solution by the presence of certain colloids, viz., mucine and urochrome, oxalates are found in urines of all reactions but are kept in solution by acid phosphates of sodium and magnesium.

The third requirement in the formation of urinary calculi is an irreversible colloid of which fibrin is a type. This is present after local hemorrhage or suppuration. It is quite likely also present after prolonged irritation of the renal tissues from the passage of irritating urine—urine which persistently contains excess of salts or bacteria.

Calcium oxalate in the urine is found in several forms, the principal one being the octahedral crystal. The dumbbell shaped form is less common and less numerous, but to us this form seems to be of special significance. We find that after dissolving the calcium oxalate crystals (and incidentally dissolving colloids) and reprecipitating them, only octahedral crystals reappear—no dumbbell shaped crystals are reformed; it therefore seems reasonable to assume that the dumbbell shaped crystals already contain colloid matter. In our opinion the presence of these dumbbells in the urine shows that the person who passed that urine is already predisposed to the formation of urinary calculi.

Prophylactic and medical treatment.—It is clear, in view of the mechanism of the formation of urinary calculi, that the digestive apparatus must be kept in good order, that oxygenation must be improved by moderate exercise and plenty of fresh air and by keeping the respiratory and circulatory systems in as good condition as possible. Modifying the diet is of lesser importance because most of the urinary calculi are made up of several salts; still it should be done. Any textbook will give lists of foods whose use is advised and of those to be abstained from.

Regulating the reaction of the urine may be of service in some cases. For example: phosphatic stones, most of which are formed in the bladder, may be modified somewhat, at least, as to the rapidity of their growth, by acidifying the urine. On the other hand, we do not know of any evidence to show that the urine may be acidified in Bowman's capsule. Clinical experience has shown that in general a mildly alkaline urine is a better solvent than a more acid urine; and diluting the urine increases its solvent power by increasing the amount of water passed. As for drugs which are solvents of urinary calculi, we know of none though some are recommended by different writers as having some solvent power.

Gumma of Nasal Septum

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Patients complaining of chronic obstruction to the breathing through their nasal passages, naturally come for relief to the rhinologist. He will find the cause as being either an hypertrophied turbinate, polyps, a deflected septum, a deflected septum with thickening, or a combination of these causative factors, and he will advise operation.

I am mainly devoting my attention in this article to the septa which show thickening. On examination in such a case, there will be noticed on one side a convexity, while the other side, instead of showing only a concavity will also show a convexity. Such patients have too often been operated upon. If a Wassermann were taken, they would be found to be specific, and if antispecific treatment were instituted, the thickness of the septum would disappear and the patient would be cured without operation. Several such cases have fallen under my observation.

Case I.—Mrs. M. V., aged forty-nine, in September, 1920, came to me with the following complaints: Pain over the nasal region, headaches, inability to breathe through her nose, this latter condition having gradually increased for the past few years; a pussy discharge from the left nostril, and some of the symptoms associated with mouth breathing.

Rhinoscopic examination revealed the septum first thickened on one side, and instead of the concavity usually found on the other side in a case of deviated septum, the second side was also convex. In other words, the septum was thickened, extending into and filling up the nasal cavities on either side. A pussy discharge was seen coming from below the middle turbinate on the left side. I went into her history very carefully and learned that there had been several miscarriages. She also impressed upon me the fact that she had for years suffered from headaches, more of a boring pain over the nasal region. I examined her further and found Argyll Robertson pupils; knee jerks were diminished, Wassermann was four plus. I decided not to operate. Instead the patient was subjected to a thorough course of antisyphilitic treatment. Six months later, there became noticeable a marked improvement in the breathing of the patient. The thickness of the septum was diminished, thus increasing the breathing space. Transillumination showed the left antrum cloudy. X ray also showed involvement of the antrum. I broke away the nasal wall of this sinus.

Case II.—A. L., a young male thirty years of age, came with the following complaints: Almost total obstruction of the nasal passages, lacrymation, and nasal discharge with slight odor. On examination I found a septum as described in Case I. It was thickened, a convexity on either side thus projecting into and occluding the greater part of the nasal cavities. I took a Wassermann of the patient and the report came back four plus. This patient also received a course of antispecific treatment and in the same period as in Case I, also noticed that he could breathe more freely through his nose. On examination, the septum was one half its previous thickness.

Case III.—Mr. J. B., aged forty, was sent to me for operation on a deviated septum. He complained of inability to breathe through the nose, of catching cold easily and of headaches. The same septum was found as in the other cases, namely, a thickened septum, convex on both sides, extending into and obstructing both nasal cavities. On questioning he gave a history of having contracted syphilis years ago. His Wassermann was also positive. This patient was treated as the others; an operation which would have been done unnecessarily was avoided.

CONCLUSIONS.

Syphilis of the nose is not so uncommon as it is believed to be. Just as it affects other organs it affects the nose. A perforation through the septum with no history of an operation, most often speaks for syphilis; of course it may be due to other causes such as constantly picking the nose or to an atrophic condition, or to infection due to diphtheria, or to tuberculosis. The point I wish to emphasize is the importance of diagnosing a case of gumma of the septum before perforation with its attending symptoms comes on. These cases come to you with symptoms of nasal obstruction. If an operation is performed, it is very often followed by a breaking down of the entire septum. If left alone, no operation being performed, and no treatment being instituted, the amount of infiltration of the perichondrium and periosteum may become extensive and marked necrosis may follow, with an inevitable loss of the bony and cartilaginous portion of the septum and in some cases suppuration of the accessory sinuses.

Whenever a case presents itself with a thickened septum convex on both sides, causing nasal obstruction, the history should be gone into very carefully to determine the existence of syphilis. A Wassermann should be taken. No operation should be performed until gumma is ruled out. If found positive, do not operate, but place patient on antisyphilitic treatment, because the prognosis as regards the removal of gummata is good, as fatty degeneration and absorption will take place under antisyphilitic treatment.

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The Intravenous Administration of Iodides*

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In a previous paper in 1921 (1) I presented a preliminary report upon the administration of iodides intravenously. Since that presentation an effort has been made to isolate definite clinical disease entities in which hypertonic solutions of iodides have produced recognizable results. The experimental work dates back about six years and was first directed toward the treatment of systemic oïdiomycosis, the objective being to place in the body a hypertonic solution of high concentration. For this a ten per cent. solution of sodium iodide was used, boiled for ten minutes, cooled and given immediately by gravity by way of the vein and requiring ten minutes for the entire amount to enter the blood stream. Within my experience, no ill effects have resulted therefrom, probably due to the fact that the solution is made up fresh for each treatment and is boiled ten minutes before being administered. Kendall (2), in his paper on the determination of iodine in connection with the studies of thyroid activity, says, "In the original method it was recommended to use a ten per cent. solution of potassium iodide. All commercial potassium iodide will liberate traces of iodine on long standing in aqueous solution—the solution must be boiled ten minutes as a minimum length of time in order to remove all traces of sulphurous acid." When solutions of sodium iodide, especially those of high concentration, are placed in ampoules and kept over a long period of time, there is a liberation of iodine which increases markedly the acidity of the solution and renders it valueless. Freshly prepared solutions, both before and after boiling, tend toward the alkaline side to methyl red and rosalic acid, as well as to litmus.

In 1919 Weed and McKibben (3) made several interesting observations upon the relation of hypertonic and hypotonic solutions to variations in brain bulk and intracranial pressure. They used as their solutions, distilled water, sodium chloride, sodium sulphate, sodium bicarbonate and glucose. In short, their deductions were that an intravenous injection of a hypotonic solution produced a marked and sustained rise in intracranial pressure and an increase in brain bulk, whereas an intravenous injection of a hypertonic solution produced an initial rise, then an immediate fall which is sustained, and a decrease in brain bulk.

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*Clinical Material and Observations made in the author's private laboratory.

That these changes are independent of the amount of fluid injected and probably due to the fundamental osmotic effects of the hypertonic solutions might be illustrated by the action of a hypertonic solution of sodium iodide in such disorders as secondary edema in arterial conditions affecting the brain. As an example: A single woman of sixty-six years, a musician by vocation, began in the spring of 1920 to suffer from a cramping of the toes of her right foot. In the fall of 1920 she became aware of a marked tremor of the right arm and an inability to associate the coordinative movements of the fingers of her right hand at the piano. These symptoms increased in severity and in December, 1921, she took to her bed. She gradually became confused, disoriented, had emotional outbursts, apparently lost her memory and reacted abnormally to sensations seen and heard. In March, 1922, the symptom complex was a coarse tremor of the right arm and leg, with muscular spasms and choreoathetoid movements and exaggerated automatic associated movements (when cooperation could be obtained), with emotional outbursts. If she sat up in bed she would double up like a jackknife and undoubling was difficult. There was no evidence of an involvement of the pyramidal system and there was an absence of sensory disturbance. Mentally she was confused, disoriented, with loss of memory for recent past. Her speech was a jargon with perseveration and echolalia. Blood chemistry presented blood sugars 150 mgm. to the 100 c. c.; urea nitrogen, 34.9 mgm. to 100 c. c.; preformed kreatnin nitrogen, 2 mgm. to 100 c. c.; whole blood chlorides, 6.2 gms. to 1,000 c. c. The carbohydrate tolerance tests revealed, 1, 150 mgm.; 2, 250 mgm.; 3, 300 mgm.; 4, 300 mgm.; and 5, 250 mgm. These symptom complexes suggested a localized lesion in or near the striatum with secondary edema. In view of this conclusion four intravenous hypertonic sodium iodide solutions were injected intravenously at intervals of five days, with the result that all the secondary symptoms, confusion, disorientation, speech jargon, illusions of sight and hearing disappeared leaving the residual tremor, choreoathetoid state from which she is still suffering. This seems to illustrate the probable reduction of intracranial pressure and brain bulk, through the medium of a hypertonic sodium iodide solution.

Hart and Steenbock (4) as well as Smith (5) have made excellent observations upon a malady occurring in pigs known as the "hairless pig malady." At first it was thought to be a protein disorder due to a restricted feeding of one or a special type of grain. A correction of this fact, however, did not always correct the disorder. It was later observed that the hairless pigs suffered from a hyperplastic thyroid. This led to the use of potassium iodide in the treatment of the hairless pig with corrective results. The dose was ten grams of potassium iodide to every hundred pounds of feed for the sow.

In lues, a not uncommon symptom is alopecia areata which is in general looked upon as a local affection even to destruction of the hair follicles. The pathology of alopecia areata usually rests with those facts—if it does respond to intensive antispecific treatment it may have been merely an affection—should it not respond in due time, there may be destruction and the condition considered a permanent lesion. Reference is not made in these remarks to the alopecia observed in postinfluenzal or scarlet fever cases which according to Parkon and Jacoby (6) respond immediately to adrenal lipoids even though, in their cases, the thyroid gland was considered enlarged.

In those cases which do not respond to salvarsan intravenously and iodides by mouth, the author recommends a series of intravenous hypertonic solutions of sodium iodide at intervals of five days. Surprising results have been obtained although in none of the cases were there any symptoms of hyperplasia of the thyroid unless one would wish to recognize the neurasthenic or psychasthenic reaction of makeup, which were the types of cases under observation, as indicative of a thyroid disorder.

As in systemic oïdiomycosis where lesions are not infrequently observed in the periosteal lymph nodes and in the bone itself, so in lues affecting the periosteal lymph nodes or the bone such as periostitis of the skull or spinal column and one which does not respond to salvarsan intravenously or iodides by mouth will respond, as in oidiomycosis, to the intravenous injections of a hypertonic solution of sodium iodide.

Why could one not give large doses of iodide possibly with a bland syrup, by mouth, and avoid the more or less selective method via the vein?

Do the results depend upon the high concentration or the intravenous channel of administration?

After a period of observation extending over several years, with sodium iodide in hypertonic solution, the conclusion has been drawn that it is of marked value in systemic oïdiomycosis.

Certain selective cases of arterial disorders in which there is a symptom complex suggestive of cerebral edema, pseudotumor or brain wetting, hypertonic sodium iodide solutions are in order.

In lues, especially in the treatment of alopecia areata and lesions referable to the bone or periosteum or both, appear to respond fairly quickly to hypertonic sodium iodide solutions.

It is the view of the author that the intravenous method is superior to the oral method in the administration of hypertonic solutions of sodium iodide, due to the fact that tissue reaction is undoubtedly more quick and that the salt reaches out into the tissue more rapidly than it could by absorption by way of the gastrointestinal tract.

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219 WATERMAN STREET.

The Treatment of Gonorrheal Epididymitis with Intravenous Injections of Sodium Iodide

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Epididymitis of gonococcal origin is an extremely painful condition for most patients, and for physicians is at times very difficult to handle in a satisfactory manner without resorting to surgical measures. Any treatment that will relieve pain and tenderness promptly and eliminate the necessity for operation deserves careful consideration. It is, of course, understood that any new treatment should present fewer elements of danger than present day accepted operative procedures. Some evidence is at hand which seems to indicate that intravenous injections of sterile solutions of sodium iodide have a remarkably beneficial effect in these cases.

In 1915, Murata (1) reported that he was successful in the treatment of gonorrheal epididymitis by the intravenous injection of thirty grams of a calcium salt solution. Stern and Ritter (2) were the first to note the effect of intravenous injections of sterile sodium iodide solutions in gonococcal disease of the epididymis. In some of their cases these observers used hot colonic irrigations and ice locally to the scrotum, in addition to their use of sodium iodide intravenously. They noted a rapid subsidence of acute symptoms. The number of cases of epididymitis that they treated with sodium iodide is not stated. Ravich (3) reports excellent results obtained by its use in ninety personal cases and seventy additional cases that he had the opportunity to observe. Many of his patients received, in addition to the sodium iodide, local treatment with guaiacol and diathermy. I first began to use sodium iodide in this manner about eighteen months ago, and the results that I obtained in my first few cases were so encouraging that I continued its use and have thus far treated seventy-four cases.

The plan that I used in the management of these cases is as follows:

An intravenous injection of a sterile solution of sodium iodide was given every forty-eight hours. The amount of the solution used was twenty c.c., which represented thirty-one grains of sodium iodide (U. S. P.). The solution has been put on the market in ampoules by several drug firms. Thirty-one grains of sodium iodide is an adequate dose where no idiosyncrasy to iodides exists. The solution was not warmed but was at ordinary room temperature when injected. All patients were recumbent while receiving the injection. The injection was administered by means of a sterile twenty c.c. Luer syringe under strict aseptic conditions. The solution was injected very slowly; the injection time covered a period of from three to four minutes. The average number of injections given were four, although in some cases more were given. No local applications were made to the scrotum. Each patient was instructed to support the scrotum with a jock strap, to avoid exercise, to drink about two quarts of water a day, to see that his bowels moved freely each day, and to take a tablet containing five grains each of hexamethylenamine and acid sodium phosphate, four times a day.

There was a decrease in the intensity of the pain in all cases twenty-four hours after the first injection. The relief was much more marked after the second injection, and after the third, seventy-three patients were relieved of their pain entirely. One patient who had a concomitant bronchitis received seven injections before his pain was completely relieved.

The tenderness was less in all cases after the first injection, and was still less marked after the second, while after the third it had entirely disappeared in thirty-seven instances. In twenty-five instances after the fourth, in nine after the fifth, in one after the sixth, and in one after the eighth injection, respectively, the tenderness in the epididymis disappeared, while in one instance slight tenderness persisted for a period of two months even after eight injections.

The effect of the treatment on the swelling of the epididymis was extremely favorable. In practically all of the cases it was slightly less after the second injection, and after the third injection the epididymis was about normal on palpation in eighteen cases. Thirty-two cases required four injections, eight cases five injections, and one case six injections for all easily discernible swelling to disappear. In fifteen cases there remained a small but varying amount of swelling after the injections, which were four in number, were discontinued. In these cases I did not feel that a small, painless swelling, without tenderness, was a sufficient indication to continue the injection treatment. Two cases showed marked swelling in the epididymis and in addition a secondary inflammatory hydrocele, after eight injections. The hydrocele in each instance was emptied by means of a Luer syringe.

The induration in the epididymis became less after each injection. There was noticeable softening after the first injection and the induration was found to be less to about the same degree and in about the same proportion of cases after the third, fourth, fifth, sixth and eighth injections, respectively, as was noted in regard to the swelling. The indurated area did not always get progressively softer after each injection; in some instances it fluctuated, but on the whole it showed a satisfactory improvement.

The number of injections required varied according to the severity of the case. I did not use less than four injections in any case, although at times it seemed as though three would suffice. No case received more than eight injections. The maximum amount of improvement occurred in practically all cases after three injections. In all cases the first four injections were given at forty-eight hour intervals, and if more injections were considered necessary an interval of three days was allowed.

Reactions were absent in sixty-seven cases. Seven patients complained of symptoms, which I considered to be evidence of iodism. Five persons experienced a sensation of tightness about their throats, in the region of the salivary glands; the sensation was noticed within an hour after the injection and lasted for from two to four hours. Two patients developed an intense headache, which came on several hours after the injection and lasted in each instance for about twelve hours. One of the two patients just mentioned also complained of an aching of his arms, legs and back, which lasted for several hours. Dizziness and extreme weakness, in addition to the sensation of tightness about the throat, was noted by two patients; in one instance it came on within a few minutes after the injection and passed off after a few moments, but in the second instance it lasted for several hours and caused the patient to remain in bed for an entire day. The injections did not in a single instance give rise to any chills or fever. No evidence of renal irritation, as shown by urine examination, was found in any case. The pulse rate was counted before and after each injection, and it remained apparently unaffected. The blood pressure was taken before and after the injection in ten instances and it was found to be the same.

All but five of the patients in this series received their injections in my office. Four of the five patients treated elsewhere were in bed when I first saw them, and so I gave them their injections at home, for a period of one week, after which they came to my office. One patient received his first injection at the office, but he became so very weak that I gave him his other injection at his home. He had in addition, however, an acute bronchitis. This same patient when first seen presented an involvement of the left epididymis, and within twenty-four hours the right epididymis became affected. The lack of immediate improvement in this case I felt was due to lowered resistance caused in a large measure by the rather severe concomitant bronchitis. It would seem, therefore, that sodium iodide can with reasonable safety be administered in a physician's office.

Leakage of some of the sodium iodide solution into the tissues during the process of injection, although not desired, is not to be feared, as the patient complains of a slight smarting pain, which dies away in a few minutes. The escape of some of the solution into the tissues occurred during two injections, but I observed no redness or edema as a consequence. Stern and Ritter purposely injected a full dose of twenty c. c. directly into the tissues of one of their patients and they state that "he complained of pain for about an hour, but there was no redness, edema or sloughing."

This method of treatment of gonorrheal epididymitis does not prevent recurrences of the epididymitis at some later period. In this series of cases recurrences occurred in three instances. In one instance the recurrence developed three months after the previous attack, in on instance after five months, and in one instance after seven months. The three patients mentioned above were treated during their first attack with injections of sodium iodide, and the injections were not discontinued until the process in the epididymis had entirely subsided, and I advised them to continue treatment until the infection in the posterior urethra, prostate and seminal vesicles had been eradicated, but all three stopped treatment when I stopped the sodium iodide injections. Therefore, in all cases after the process in the epididymis has subsided, it is necessary to carry out the routine treatment of the gonococcal infection in the seminal vesicles, prostate and posterior urethra. If a recurrence does occur in a case that has been previously treated with sodium iodide, the recurrent epididymitis responds to the injection of sodium iodide a second time as favorably as those cases receiving it for the first time.

Since I began using sodium iodide in gonorrheal epididymitis, I have not seen a single case in which epididymotomy was necessary, and I am convinced that its general use will reduce the number of cases now considered operable to a much smaller minimum than now obtains. In fact, I feel that its general use would seem at least to offer some promise of doing away with the necessity for surgical intervention in these cases entirely. In general, the results that I have obtained by the use of sodium iodide have been far superior in every way to the results that I have obtained by the use of all other methods, singly or collectively.

The mode of action of sodium iodide solutions in gonococcal disease of the epididymis is obscure. Favorable results have been reported from its use in gonorrheal arthritis and prostatitis, but after using it in four cases of gonorrheal arthritis, in four cases of gonorrheal salpingitis, and in ten cases of gonorrheal prostatitis, I discontinued its use, as the results that I obtained in these cases were on the whole discouraging. In this connection I might add that the administration of sodium iodide for gonorrheal epididymitis, did not, so far as I could judge, materially help in the eradication of the disease from the prostate, seminal vesicles, or posterior urethra.

I have observed, however, that intravenous injections of sodium iodide apparently exert a beneficial influence in certain cases of importance occurring in persons having a gonorrheal infection in their prostate and seminal vesicles. My attention was first drawn to this action by a patient, whom I had treated five months previously for gonorrheal epididymitis with sodium iodide, and who had returned with a recurrent epididymitis. When I informed him that I was going to give him some more injections of sodium iodide, he replied that he was glad as the injections administered five months previously had markedly increased his sexual vigor. After this I carefully questioned all of my epididymitis patients about their sexual vigor, and four patients out of twenty-six questioned, gave a history of partial impotence—premature or quick ejaculations, or feeble erections of the penis. These four patients eight months later reported a marked improvement in their sexual powers following the sodium iodide injections, which were given for their epididymitis. Six cases of apparently total impotence, occurring in persons who had also a gonorrheal prostatitis, were treated with injections of sodium iodide. Each patient received six injections. At the end of two months, three patients stated that their sexual powers were again apparently normal, one reported a slight improvement, while two noted no improvement whatever. This indicates, I think, that sodium iodide may become an aid in the treatment of certain cases of impotence in patients in whom gonorrhea is an etiological factor.

CONCLUSIONS.

1. Intravenous injections of sodium iodide solutions are of distinct value in the treatment of gonorrheal epididymitis.

2. Indications are that it might become an aid in the treatment of certain cases of impotence, in which gonorrheal infection enters into the etiology.

3. Its exact mode of action is unknown, but its administration is practically free from danger.

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218 WEST 139TH STREET.

Chronic Gonorrhea of the Prostate and Seminal Vesicles*

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Gonorrhea is chronic when it has lasted for over six weeks. It is dependent upon pathological changes which must be understood in order to apply the proper treatment. In most cases, especially those of long standing, both prostate and vesicles as well as the urethral canal participate in the pathological changes and a systematic examination is necessary to locate the various lesions.

The important pathological change in the tissues in chronic gonorrhea is the infiltration of small round cells under the mucous membrane surrounding and embedding Morgagni crypts and Littré's glands, their mouths being held open in some cases, in others tightly closed, their cavities incubating colonies of gonococci. If this infiltration is superficial it is absorbed; if extensive, it is converted into connective tissue, forming strictures and erosions with granulations and a gleety discharge with exacerbations.

The treatment is designed: 1. To rid the tissues of gonococci; 2, to cure catarrhal inflammation and promote formation of epithelium over the erosions; 3, cause absorption of infiltration; 4, restore intraglandular and periglandular infiltration and inflammation.

These indications can be met by irrigation of the urethra with antiseptic and astringent solutions and by dilatations with sounds and dilators. The solutions used are silver nitrate every second day, or potassium permanganate every second day, as soon as the diffuse inflammation is reduced to isolated spots, as denoted by the first glass being clear with shreds which persist until cured.

Absorption is promoted by passing steel sounds to 30 or 32, doing mestatomy if necessary. Gentle massage over the urethra, over sounds, with the fingers helps. In recent cases sounds are passed every fourth day; if the reaction has subsided in hard infiltration the interval should be one week. This is of course contraindicated in recent inflammation. One should wait until the urine contains only shreds. Large numbers of cases require larger dilatations than 32 French to reach deep seated infiltration, which indications can be met with Kollmann's dilator, gradually increasing the size to avoid tearing the mucosa.

Many intractable cases of gonorrhea, lasting for years in spite of treatment, are caused by chronic inflammation of Morgagni's crypts. They show few symptoms, usually only the morning drop, but are characterized by acute exacerbations after slight provocation, leading the patient to believe he has a fresh infection. Urethroscopic examination shows a few open and inflamed mouthed crypts; in others the mouths are occluded by the growths of epithelium. When these crypts are infected the gonococcus may remain in them for years, the patient remaining a carrier of infection. These cases should be treated by dilatations at the beginning with a full sized sound, followed by irrigation, but later a Kollmann's dilator should be used once a week, increasing one or two numbers at a time. Usually a maximum dilatation of from 40 to 45 will suffice to open the glands, force out the purulent secretions, and cause absorption of periglandular infiltration and a return to normal. Not uncommonly, however, this will not suffice; a few crypts persist to harbor the infection and inflammation. These should be destroyed with the cautery, three or four at a time, through an endoscope. The cauterization must be rapid and superficial to avoid stricture formation.

The posterior urethra is involved in from forty to eighty per cent. of all cases of acute gonorrhea. Many cases never become chronic, but when they do the posterior urethra remains inflamed as often as does the anterior urethra. Acute posterior urethritis is invariably caused by gonorrhea, but the chronic form is caused in other ways, especially by excessive coitus or sexual abuse, such as masturbation and withdrawal. In the presence of free pus, urethrovesical irrigation with silver nitrate solution, one to one thousand, or potassium permanganate, one to three thousand, rapidly reduces the purulent discharge. After the urine is clear, examine the vesicles and prostate and massage if diseased. When urethral examination shows inflammation localized to the colliculus, direct application of nitrate of silver solution, fifty to one hundred grains to the ounce, once a week through the posterior urethroscope will be required. Granulations in posterior urethra should be cauterized with strong solutions of silver nitrate, and small polypi or granulations of colliculus may be removed with silver scissors or the galvanocaustic paint. If the utricle is infected, inject with solution of nitrate of silver. The hard submucous infiltration is absorbed after dilatation.

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Acute Gonorrhea*

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The acute phase of gonorrheal infection offers to the urologist an opportunity to exert an immense influence for the ultimate good of his patient. The successful management of the inflammatory process in the early stages may be the means of saving a long and tedious course of treatment, and avoiding the disheartening sequelæ which so frequently occur in many of the indifferently cared for cases.

Acute infectious processes anywhere must be considered from a different angle than those which have become chronic in their character. Particularly is this true of acute gonococcic infection whether it be in the genitalia or elsewhere. The dividing line between acute and chronic gonorrhea rests to a great extent with the individual surgeon, and depends largely upon his personal experience. It may be well to define the limits of acute gonorrhea as "any recent and active inflammatory process in the urogenital system, caused by the gonococcus."

In my own practice it is my habit to make a more or less definite division of the cases into three groups, depending upon the region involved and the extent of the lesions present.

Group 1, comprises all those cases which are still limited to the anterior urethra; group 2, consists of a small number of cases in the early posterior stage where no adnexa are affected; group 3, embraces all those cases in which posterior urethritis is present, complicated by infection of one or more of the adnexa. This classification of cases while arbitrary to some extent gives a standard for diagnosis, and in no way prevents further and more accurate grouping for special purposes.

In group 1 are found all those cases in the initial stages, and some of the more fortunate later ones where the second glass of urine is still clear, and none of the organs beyond the compressor muscle are affected. In group 2 are those few cases in which both glasses of urine are turbid, where no spreading of the process has occurred into the deeper structures, and none of the symptoms of posterior urethritis are present. This group of cases may still be thought of as simple urethritis behind the compressor, but still on the mucous membrane, without having penetrated into the submucosa, and not involving the adjoining organs.

In the third group appear those cases which are characterized by the frequent, burning, urgent urinary efforts which are sometimes accompanied by terminal hematuria. It is here that some degree of adnexal infection is always present, and this is the group of cases that must be watched with the greatest concern by the conscientious urologist. Even after the apparent subsidence of the severely acute period these are the cases that often harbor infection for long intervals without proper surveillance. It is this type of case that continues to have reinfection after reinfection, and that carries the gonococcus into new and fertile fields.

For the purpose of laying down principles of treatment groups 1 and 2 may be considered together as being both surface infections, though they differ vastly in their possibilities of early cure. In the purely anterior cases the failure to get a good result with reasonable care and attention is rare. In the deep superficial, or posterior superficial cases the odds are that the infection will spread. In the cases that have already reached the prostatic ducts, the ejaculatory ducts, the prostate gland itself, the vesicles, or the epididymes, the methods and indications are entirely different.

The pathology underlying these several lesions must be fully appreciated before any line of treatment can justifiably be undertaken. Gonorrhea has a pathological anatomy just as any other disease, and this fact is often overlooked by many practitioners. There has been and still is so much of empiricism and mystery about gonorrhea in many minds that it is time a rational and intelligent basis was found for any therapeutic measure which we intend to employ. The first consideration is the anatomy involved, and its accessibility to treatment; the second the physiological reaction of its region to the agents employed; the third the technical details of applying the remedies selected.

In the first group of our cases the object is to limit the infection to the area already affected. In the anterior group of cases this is a comparatively simple problem. The pendulous urethra is easily accessible, and offers no obstacle to direct medication. The indication here is sterilization of the mucosa. Until the introduction of the acridine series of dyes this sterilization was attempted by such antiseptics as potassium permanganate, argyrol, protargol, albargine, and a host of other lesser remedies, with somewhat disappointing results. Since acriflavine has been available I think that it is possible in most of the group 1 cases to keep the infection within bounds. Either as an irrigation, or as a hand injection to be used by the patient, or better, a combination of the two, properly prepared solutions of acriflavine will almost always sterilize the mucosa of the gonococcus, and do less damage than any other single preparation. Its one disadvantage is that its use cannot be prolonged beyond a period of two weeks without causing some submucosal infiltrations. The strength employed is one to four thousand or less in distilled water or normal saline. In this dilution the solution is usually nonirritating, even when used three or four times a day. Most satisfactory results have been obtained when four to six ounces are allowed to run into the bladder, after washing the anterior urethra with an ounce or two. This is held in by the patient who grasps the meatus snugly, with the urethra gently distended, for a period of five minutes by the watch, when it is voided. Another quantity of about three ounces is then introduced and the patient retains this until he voids again. If irrigations are employed, they should be given once or at most twice daily, and the hand injection be used twice. If no irrigation is used, the hand injections should be taken three times a day. I have seen so few mishaps with this procedure in my own hands that I use it as routine whenever possible. The results are so uniformly good that only those variations suggested by experience in the hands of the user himself should be attempted.

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Diet is an important factor in the care of acute gonorrhea, although the restrictions laid down by some authors are ridiculous. A bland, moderately nourishing food intake with meat limited, condiments and spiced foods excluded, with plenty of cereal and fruit units will in no way harmfully affect the patient. Liquor of any kind is forbidden, not altogether because alcohol is detrimental, but because it induces overexcitement and indiscretions. Muscular activity should be limited to the minimum for the status of the patient, and complete rest would be ideal if it were practicable.

In the acute phases much has been written about the use of vaccines, but in my experience they are totally useless in the group 1 and 2 cases. There is so little specificity in the gonococcus protein as it is ordinarily provided that in anterior and in superficial posterior cases the use of specific vaccines is hardly warranted.

The use of the various urinary antiseptics is very questionable therapeutics. There is no proof that hexamethylenetetramine, were it as much of an antiseptic as is asserted for it, ever reaches below the topmost layer of the epithelial lining of the passages. It is without any cleansing effect in the dilution in which it comes through the urethra. The same objections apply to the several balsams whose use is almost wholly superstition handed down from former generations.

Water is probably one of our best medicines in any stage of gonorrhea, just as it is of value in any inflammatory process. In urethritis its free use will give a bland nonirritating urine to flush the parts frequently, and will serve to reduce the toxic effects especially seen in the posterior cases.

The use of heat locally in the form of hot baths, or as an external application, is sometimes very grateful, and often serves to quiet the discomfort in urination if present. Cold may be substituted if more agreeable to the patient. If there are painful erections some simple sedative may be prescribed, and if this fails, camphor in oil may be injected into the gluteal muscles. In anterior cases it is rare to have to resort to narcotics. A suspensory should be worn by all patients even from the very beginning.

In all manipulations whether by the surgeon or the patient the utmost care and gentleness should be insisted upon, in order to avoid damage to the mucosa as far as possible. If the treatment outlined above is successful, and it is in ninety-five per cent. of the anterior cases, and in about thirty per cent. of the superficial posterior cases, the result is the disappearance of all gonococci in from seven to fifteen days. There will still be seen a thin watery discharge which shows leucocytes and epithelial cells, but there will seldom be found any gonococci. This thin discharge will remain watery in character or disappear if the infection be ended. If the mucosa has not been sterilized, the discharge quickly assumes the same appearance as in the acute cases. Those cases remaining free from discharge for forty-eight hours after the cessation of all treatment, may be considered cured tentatively, although the cure cannot be as yet scientifically established. These cases may be allowed to rest from further treatment for a period of two weeks, although the hygienic regimen should be maintained as before.

At the end of two weeks, the presence of infiltrations along the mucosa is estimated by the use of the *bougie á boule,* and the appropriate sounds are passed at weekly intervals until the natural calibre of the urethra is restored. The first examination is made upon a bladder full of acriflavine, so that if by any chance there are gonococci present in the glands they will be killed before fresh harm can be done. I rarely make the silver nitrate provocative test until the end of the fourth or fifth week.

If acriflavine does not produce the effect of completely sterilizing the mucosa its use should be discontinued as its continuance will inevitably cause dense stricture formation. It will be wise to shift to some other solution such as permanganate, or protargol, and await the disappearance of the discharge, when the same procedure as before should be followed before the patient can be discharged.

Unfortunately we are not universally successful in this as in any other disease, and occasionally an anterior case does not clear up and the posterior complications develop. This occurs more readily in the cases which we see for the first time in the posterior superficial state. It is often said that the infection is "driven back" by the use of injections and irrigations. This appears to me a fallacy, as it is extremely unlikely that the infection travels along the surface of the urethra, but is rather transmitted by the lymphatics, in the submucosa. I have seen as many cases of posterior infection in cases that have never had any injections or irrigations, as I have in those where these measures have been employed.

Those cases in which the adnexa are infected present an entirely different picture from that seen in groups 1 or 2. While the anterior urethra has a naturally good drainage, if there be no deformity, there is no external drainage in the deep urethra. Such drainage as is present is backward into the bladder, due to the fact that the internal sphincter relaxes more readily than the compressor muscle. It is this fact that accounts for the second glass of urine being cloudy in the posterior cases. In these cases we are no longer dealing with surface infection, but with actual invasion of the deep structures. From a philosophical viewpoint we may consider these cases in one group regardless of the special organs involved, although each has its own special indications. The organs are usually infected in about the following order, based on the frequency of occurrence; prostate, vesicles, epididymis. The vesicles are apt to give fewer signs of infection than either of the other organs, although they are invariably infected if the epididymes are.

It makes little difference which of these organs is affected, so far as the general principles of treatment are concerned. The most important single measure is rest, as complete as can be obtained for the patient. All muscular exertion should be avoided, particularly heavy lifting, and excitement of any kind is deleterious. Next in order is heat, locally applied, or cold if better born. For the prostate and vesicles this takes the form of the rectal douche or the sitz bath; for the epididymis, the hot water bottle or the ice bag. A very effective method of getting heat into the deeper structures is the high frequency bipolar current. This is used for the prostate and vesicles with one pole in the rectum, and one over the lower abdomen, or in the perineum; for the testicle one pole above and one below is effective. If this can be tolerated it gives great relief and seems to shorten the duration of the infection.

Sometimes the suffering is severe, though seldom unbearable, and it would seem that operative relief were imperative. Particularly is this true in epididymitis. I have never opened, or assisted at the opening of a prostatic abscess, or of an epididymis for gonococcic infection. The majority of the cases will go on to spontaneous absorption, without interference, and the sequelæ are easier to handle.

Local treatment by injection or irrigation must here be avoided, first because of the danger of doing direct damage to the parts, and second because the remedies employed cannot reach the areas mainly affected. Again, attempts to sterilize the urine have no effect on the general course of the disease and the urinary antiseptics and balsams are mentioned only to be condemned. There is absolutely nothing to show that these substances are present other than in the urine, and they do not penetrate the tissues at all, nor come in contact with the organisms below the surface. No case will ever be cured by their use alone, if no other measures are taken, and most patients do better without them than with.

Inasmuch as all these patients with posterior involvement display some degree of general bodily reaction, I am convinced that any agent which will serve to raise tissue immunity either specifically or nonspecifically is of value. The various gonococcus vaccines that I have used have been a disappointment, whether simple or mixed. They have little or no local reaction, and they generally do not produce any general reaction. We do know that persons develop some degree of immunity as evidenced by the fixation tests, although the immunity is of low strength, and of short duration. Whatever the immunity mechanism may be it is not stimulated by the gonococcus vaccine in most persons. I believe, and my experience seems to bear me out, that the resistance processes are best stimulated by the use of some nonspecific protein which gives a high degree of local and general reaction. The Bacillus typhosus vaccine commonly used for immunization gives the best results both in local reaction at the point of injection, and in general febrile reaction. It is during this reaction to the nonspecific protein that the immunity system is stimulated into activity, by the gonococcus antigen already present in the course of the disease. I use an initial dose of a half mil. and repeat on the third or fourth day. It is rarely necessary to give more than three doses before the infection is well on its way to resolution.

For the urgency and frequency the use of alkalies is very good, and liquor potassæ in from five to eight minim doses is effective; citrate of potash is valuable, as is bicarbonate of soda. Fruit juices are well tolerated and serve the same purpose. Among the sedative drugs the tincture of hyoscyamus is excellent in thirty to sixty minim doses, although pharmacists will continue to object to the size of the dose. In some few cases the suffering may be so severe that only one of the opiate drugs will give relief.

It is hardly likely that every case will come to such extreme difficulties as are herein outlined in the acute stage, although gonorrhea may sometimes be a severe and distressing disease. It will be possible to make bearable such complications as do occur if some of these suggestions are followed. It will also hasten the ultimate cure if care is taken in the early stages.

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When Is a Man Cured Who Has Had Gonorrhea?

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The practice of medicine is a commercial enterprise or a profession according as the motive of financial gain or human service takes precedence. The physician is frequently called upon to render services which can never be repaid with coin of the realm. Of such a nature is the counsel he is sometimes asked to give when a young man who has been infected with gonorrhea wishes to know when it will be safe for him to marry. Because he is conscientious he wants a specific reply. He wishes to be assured beyond a peradventure that there is absolutely no possibility of transmitting his infection to the girl whom he expects to marry. Vague generalities based on collected statistics on the prognosis of gonorrhea, useful as they may be to the doctor, cannot satisfy this inquirer. It is well enough for the physician to know that in the large majority of cases which receive proper treatment, the danger of infecting the marital partner is slight, but the patient wishes to know, and has a right to ask, whether in his particular case the infection is entirely banished. The advice given him may determine whether the future of the questioner and of the woman who has agreed to tread life's path with him shall be a joyous one or a black tragedy. And whether he likes it or not, the physician confronted with this vexing medicosocial problem is expected to shoulder his share of the obligation—his share we emphasize, for it would be obviously unfair to burden him with full responsibility since medicine has not yet been reduced to an exact science, and no doctor can predict with certainty or guarantee the outcome of any given pathological condition. What may fairly be expected of the doctor is that he familiarize himself with all methods and procedures designed to determine when gonorrhea is cured and, further, that he be able to give his patient a clear, intelligible reply. If in a given case it is impossible to give a categorical answer, the physician must at least be able to explain the situation to his patient so that he, in turn, may assume the full responsibility of his undertaking.

An examination of the literature bearing on the determination of cure of gonorrhea reveals that opinion is not unanimous and that standards proposed by various authors are by no means fully accepted by others. Some, being of the conviction that no test for the determination of a cure for gonorrhea can be too drastic, insist on very rigid standards. Others advocate a mild type of test and are satisfied merely to know that in the struggle of bodily resistance versus the infecting organism the former has at last gained the upper hand. This may satisfy the superficial and may be sufficient in so far as the physical wellbeing of the patient is concerned, but it does not take into consideration the important fact that gonococci which have become attenuated or held in check by a newly acquired resistance, may, when transplanted on virgin mucous membrane, set up a new infection more disastrous than that of the original infection. Mild standards, therefore, cannot be too severely condemned. On the other hand, too severe tests tend to prolong treatment to the point where it does actual harm and also to make of the patient an introspective neurasthenic. Somewhere between the two extremes lies the sensible course—a workable standard which the conscientious practitioner may apply in the knowledge that his full obligation has been discharged and that the welfare, physical and mental, of the patient is safeguarded. Perhaps a brief survey of the several tests which have been proposed by various investigators would be timely.

The alcohol test.—The irritating effect of alcohol on a urethral infection has been so well established that it was utilized as a test for the cure of gonorrhea. If, after extended treatment and cessation of the gross symptoms, the patient imbibed freely of beer or other alcohol and there followed no relapse, the patient was declared cured. This method of determination of cure is, to say the least, unscientific and inexact.

The fatigue test.—Hard work or exercise carried on to the point of fatigue is likely to light up a dormant gonorrheal infection, if such exists. If, after such fatiguing exercise, the discharge does not appear and the urine remains clear and shredless, the presumption of a cure is favorable. But only as the test is negative can it be relied upon with any assurance.

The discharge test.—A urethral discharge may exist even after all gonococci have been eradicated. Such discharge is probably due to overtreatment from the irritation following medication or instrumentation. But so long as a discharge of any kind exists the patient cannot safely be declared cured. Stickiness of the meatus implies that a slight discharge is present. Gentle massage of the urethra from bulb to glans generally brings to light a discharge if present, but Fraser (1) warns insistently against this procedure.

The urine test.—It is best to apply the two glass test to the first urine passed in the morning. A clear urine alone means little, though it furnishes presumptive evidence that there is no active inflammation. On the other hand, shreds may persist indefinitely and do not necessarily prove the presence of urethritis. Shreds may at times be found repeatedly in a normal individual. It is necessary also to inspect the urine passed immediately after prostatic and vesicular massage.

The vaccine test.—After all symptoms have subsided a dose of gonococcus vaccine (100,000,000) may provoke symptoms if there are hidden or latent lesions. The vaccine test is not to be resorted to until several symptomless days have passed. This test has definite value and is harmless, but must be interpreted only in conjunction with other tests.

The cultural test.—Herrold (2) has concluded that cultures made of expressed prostatic and seminal fluids on phosphate agar with blood and ascitic fluid on plates incubated under reduced oxygen tension, are the most reliable single means of determining the termination of a gonorrheal infection. He has demonstrated that the test is positive in many cases in which all other tests have been negative. To carry out the test requires, of course, special laboratory equipment and training.

The complement fixation test.—The reaction of this test depends on the presence of specific antibodies in the blood and the results, as is the case with the Wassermann test, require a careful interpretation. If there be a colony of gonococci walled off securely from the general blood stream, the test may be negative and the superficial observer may be led astray. In fact, there are a number of variable factors involved in the test, hence the possibilities of error are many and the reliability of the test is questionable.

The microscopic test.—As a diagnostic measure the demonstration of the gonococcus by the microscope is perhaps the surest proof of gonorrhea. Systematic microscopic examinations are serviceable during the course of treatment as the relative number of gonococci and the changing picture of cellular content of the smear furnish a valuable gauge as to the course of the disease. However, as a measure of determining the cure of the infection, microscopic examinations are of little value. At best, it is difficult to demonstrate the gonococcus in a patient who is almost well. As previously noted, so long as there is any secretion the patient cannot be declared to be noninfectious.

Some investigators have argued that the gonococcus gradually loses its virulence and that the patient, to all intents and purposes, may be cured and yet harbor the germ in his urogenital tract. This may be true but it is yet to be proved whether the abatement of symptoms is due to a real loss of virulence of the gonococcus or to the development of a resistance on the part of the host sufficient to hold the gonococcus at bay. If the latter is true, it would be most unwise and pernicious to discharge as cured a patient who is symptomless but who still has gonococci present in his tissues, for if these germs are transplanted on new or virgin soil they are likely, even assuming that their virulence has been attenuated, to take a new lease on life, so to speak, and set up a violent inflammation. It requires no great strain on the imagination to picture the possible results of such a happening. As long, then, as gonococci may be demonstrated, it is unsafe to declare the patient cured no matter if all other symptoms have disappeared. In examining smears made of prostatic and seminal secretions due attention should be paid to the cellular count. Leucocytes and pus cells mean inflammation, and so long as they are present cure is out of the question.

The urethroscopic test.—It would seem that if all other tests had proved negative urethroscopic examinations would be superfluous. If after several weeks all symptoms have abated, a urethroscopic examination which reveals a normal mucosa throughout the tract is reassuring. If practicable, such an examination should be made.

These are the tests generally advocated for the determination of cure of gonorrhea in the male. After this brief consideration of them what conclusions may we draw? The most obvious is that no single measure can be relied upon to determine a cure, but that several, sometimes all, must be performed and the results carefully correlated and interpreted in order to decide the question. Determination of cure is but the art of making an exact diagnosis. Osler,Cabot and others of our great teachers have emphasized the point that a diagnosis is seldom based on a single finding or symptom. It is only by painstakingly gathering all available objective and subjective evidence, weighing it and carefully considering it from several angles, that a scientific diagnosis can be made. The determination of a cure in gonorrhea cannot be reduced to a simple, exact formula. There is no slide rule with which to calculate the answer. The personal equation enters in and the possibilities of faulty judgment are always present, but given a reasonable chance and a cooperative patient, the average, welltrained general practitioner, assuming that he has a conscience, may safely be relied upon to find the correct answer to the important question.

Another conclusion to be drawn is that the time element is extremely important. It is a mistake to lead the patient to expect a speedy cure, for with each disappointment his discouragement is likely to increase. No attempt should be made to determine a cure until all symptoms have ceased for at least three weeks. Nor should the doctor be too hasty in declaring the patient cured. Subsequent examinations, two, three, and six months later, should be made, especially if the question of marriage hinges on the issue.

A third inference to be drawn is that mere laboratory tests are not sufficient. Good physicians of the old school lacked many of the refinements of diagnostic technic which we enjoy today, yet performed creditable work because they observed and scrutinized the general condition of the patient and followed the stages of his condition carefully. General clinical observation, including examination of the urethra for stricture, possible abnormalities of the epididymis, and, if possible, a urethroscopic inspection, should be made to confirm the findings of the special tests. By no means unimportant is the consideration of the patient's mental condition. Many a man has suffered more psychic than physical trauma, as a result of a venereal infection.

This is hardly the occasion to warn against the danger of overtreatment but it should be kept in mind that an overzealous physician in his determination to establish a cure tends to employ too drastic methods or to prolong treatment, much to the detriment of the eventual welfare of the patient. The urogenital tract may not with impunity be abused by extensive instrumentation or medication. In many instances it is well to suspend all treatment for a limited period of time.

It is significant that the determination of a cure in gonorrhea was one of the important questions which engaged the attention and deep study of the All America Conference on Venereal Diseases, held in Washington, December 6 to 11, 1920. To Sections 3 and 4 of this conference were assigned special questions bearing on the scientific aspects of gonorrhea in the male and female. The sections were composed of recognized leaders in their fields in this and other countries. One of the efforts of these sections was to determine, if possible, criteria for pronouncing a case of gonorrhea cured, which would be safe in the hands of general practitioners and at the same time practicable. The results of the long, careful deliberations of the sections took form in a resolution which was adopted later by the General Conference Committee. The text of the resolution is as follows (3):

"*Resolved,* That with our present knowledge it is not scientifically and medically practicable to establish a standard for determining when gonorrhea is cured. This statement, however, must not be understood as reflecting upon the ability of any specialist to make such a decision."

The next paragraph of the resolution discusses the reasons why it is difficult to establish a standard of cure in the female. The resolution continues:

"On the other hand, in the male it is practicable to establish a reasonable standard for determining when gonorrhea has been 'probably cured.' The criteria are based upon two distinct entities—a, cure of the infection; b, cure of the lesions of the disease.

"In gonorrhea, whether in the male or female, the duration of infectiousness has but a single slight relation to duration of the lesions—that is, the symptoms may continue long after the infectiousness has ceased, and, conversely, infectiousness may persist after all obvious symptoms have ceased.

"As the problem is confined exclusively to the question of infectiousness, the word 'cure,' as here used, will be understood as equivalent to cessation of infectiousness.

"There is no combination of clinical facts which constitutes conclusive evidence of a cure of gonorrhea in the male. Therefore, the determination as to whether cure has been effected depends upon the acumen and skill of the physician. The patient may be assured that he is probably cured if all of the following criteria are fulfilled:

"a. No urethral discharge whatever for one month, during which time the patient is under observation without treatment.

"b. The first ounce of urine passed in the morning free from any cloud of pus, as examined in a glass or bottle by a strong light.

"c. All shreds in the urine continue to float at least two minutes after agitation of the fluid has ceased.

"d. Massage of the prostate and seminal vesicles expresses a fluid which, when examined under the microscope, is found to contain no gonococci or pus cells.

"e. It should be possible to pass a 26 F sound into the bladder, and examination the following day should satisfy conditions a and b.

"f. If these findings are confirmed at a second examination one month later, during which time there have been no symptoms or treatment, the patient should be regarded as cured.

"All other cases should be examined by an expert, in order to determine whether or not they are cured."

Naturally, this body of recognized authorities drafted their resolutions with exceeding caution. What they are chiefly concerned with was the question of limiting the spread of gonorrhea, hence without quibbling over the academic meaning of the word cure, the criteria were drawn up to apply to the determination of the cessation of infectiousness. On first glance it is somewhat discouraging to note that the sections dared not commit themselves beyond establishing a reasonable standard for determining when gonorrhea is probably cured. On the other hand, the standards advocated are obviously simple, fair, and include as much as may be reasonably expected from the general practitioner. May we repeat that the determination of a cure in gonorrhea depends more on the acumen and judgment of the physician than it does on certain set rules or rigid procedures?

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Neisserian Infection Treated by a New Modality, Infrared Light

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Dorland defines light as "ethereal vibration which gives origin to the visual sense." Webster's definition is still more obscure but from these definitions has arisen great misconceptions of the truth of light and its application to medicine. Maxwell's theory is undoubtedly the right one: "Light is electromagnetic vibrations." This is true regardless of whether it has to travel through ether (Lodge, *et al*) or whether there is no such thing as ether (Steinmetz).

Light, as defined by Dorland and Webster, shows a peculiar analogy of a general acceptance of the truth of the theory as an exception to the truth, for the light affecting the visual sense consists of only seven colors, each characterized by a certain and unchangeable wave length. Change the wave length and you change the color. Light, then, affecting the visual sense, consists of seven eighths of an octave. While, at the same time, it is known that of light visible and invisible there are sixty-seven octaves or approximately seventy-five times as much light which does not impress the optic nerve as that which affects the visual sense.

The average physician, seeing the operation of the Crookes tube, for the production of x rays, or the mercury arc in quartz for the production of ultraviolet rays, is likely to forget that these rays are invisible. Both of these devices produce more or less visible light of peculiar colors, which are mistaken for the desired rays.

The spectrum of the quartz mercury arc shows as follows: Visible to the human eye, twenty-one per cent.; infrared (invisible to the eye), fifty per cent.; ultraviolet (invisible to the eye), twenty-nine per cent.

The ultraviolet band of the spectrum covers less than two octaves and is situated immediately above the visible spectrum. Immediately below the visible end of the spectrum is situated the infrared spectrum, which covers about nine octaves. That is about four times the ultraviolet spectrum, and ten times the visible spectrum.

As opposed to the ultraviolet spectrum the infrared shows slight actinic or chemical properties. It is constructive, as upon it depends all vegetation, hence our life depends upon infrared (1). But its greatest usefulness depends on its ability to penetrate substances deeply, and in this way exercise a healing warmth.

Have you ever noticed that deep drifts of snow melt more at the bottom than at the top, when the sun shines on it? This is brought about by infrared rays. These rays penetrate deeply before being converted into heat and therein lies their great value in medicine.

Every healing process requires an increased temperature. A bone is broken. Nature sends an additional supply of blood and higher temperature to the area to heal it. To make the matter more precise and exact, Nature requires an active hyperemia for repair and any agent that will cause this active hyperemia is a curative agent of highest value. It is difficult to consider a single pathological condition, in which stasis does not exist, and any agent that will bring an additional amount of freshly oxygenated blood to a diseased area will tend to destroy the infection and hasten resolution.

One of the most important observations made during the World War was this—If a soldier had either an acute or chronic stage of Neisserian infection, and if at the same time he had some condition causing a febrile state in which the temperature was above 99.7°, the Neisserian infection was cured if the increased temperature from the secondary infection persisted for a few days. If this is true, and the fact is attested to by many careful observers, what more rational method of treatment could be devised than one which would give to the affected area a local temperature of 100°.

The theory is that this continual temperature, although only slightly above the normal temperature at which the micrococcus lives, is sufficiently high to lower its resistance until the normal protective processes of the human organism can control and finally destroy the invading microorganism.

Robinson (2) observes "Just as gonorrhea is one of the greatest factors in causing *impotentia cocundi,* so it is the greatest factor in *impotentia generadi."* . . . "Here again we meet with the gonococcus as the greatest factor in race suicide." . . . "Gonorrhea is one of the greatest factors in sex impotence" and most important, as he states: "The danger is not alone in leaving active or dormant gonococci which may in years to come infect and wreck the life of a healthy young wife; there is also danger of leaving a hyperemic patch in the posterior urethra which may come in time to become the direct cause of impotence." Dr. G. W. Overall (3) states: "Seventy per cent. of all blindness and seventy-five per cent. of all diseases of women are traceable to prostatic urethritis following acute gonorrhea in men." White (4) says, "I know that the majority of men who have been infected with gonorrhea have not been cured and are capable of infecting their wives."

A host of authorities assert that the majority of men over forty-five years of age have pathological prostates as the result of gonorrhea, probably acquired in youth and supposedly cured.

And what do we find as the result of prostatic disease—the entire gamut of neuroses and psychoses, chronic invalidism.

But *retournons aux nos moutons,* if we accept the statements so well attested that a continuous temperature of slightly above the normal 98.6°, will lower the virility of the gonococcus to the extent that the normal body protective agents will destroy the invader we are brought to the question of what modality will harmlessly produce this slight increase in local temperature.

Snow (5) makes this unqualified statement: "Radiant light penetrates the tissues to the depth of four to six inches, the infrared rays of the invisible spectrum penetrating to the greatest depth. Radiant energy is converted into heat units in the structures beneath the skin to considerable depths even through layers of bone. Naturally the energy of the effect diminishes with the depth, but the hyperemia resulting from the heat produced in these tissues as well as the effect of light renders remarkable service in point of increasing nutrition, metabolism, and phagocytosis."

Heat as applied locally to the surface by hot water bottles, or electric pads, can be of little service as the heat is carried away by the vascular system as rapidly as it is transmitted to the epidermis. Considerable improvement was made in the use of the urethral and rectal psychophore, but the greatest difficulty was in the fact that there was more or less leakage of water, the impossibility of getting and maintaining the water at the right temperature for the long periods of time necessary so to weaken the virility of the bacteria that they could become prey to the phagocytes and antibodies in the blood stream, and the heat was only obtained at the required point by simple conduction through the tissues. Quite often, too, the heat was disseminated before it reached the focus for which it was intended. Yet with all these drawbacks excellent results have been reported by careful observers.

Thiedering's conclusions regarding the penetrating properties of infrared radiations and their deep hyperemic producing capabilities agree most exactly with those of White, Snow, *et al.* Their conclusion is so important that it will be well to repeat it.

"Infrared rays are not heat but are light rays capable of deep penetration into human tissue and there converted into heat, thus obtaining the healing and safe hyperemia so necessary to repair and relieve from hyperesthesia."

The infrared rays were first used in Germany as a curative agent and some wonderful clinical reports from there attest their value in many untoward conditions. However, the German apparatus was bulky and difficult to handle and the wave lengths produced were not the most desirable lengths for the best therapeutic action, and it again devolved on Yankee ingenuity to devise and perfect a set of infrared appliances.

The orificial appliances are constructed of a material, which, after long and careful tests, most nearly approximated a perfect black body, and when heated to a moderate temperature, produce the greatest amount of invisible infrared light rays.

The well known principle of physics (the total absorption of radiant energy by reflection from the walls of the hollow wedge) is used in a set of appliances for external application. A long series of laboratory tests show that the instruments give off a large volume of infrared light which deeply penetrates human tissue and produces an active hyperemia even in the bone marrow on the heavy bones of the skeleton.

Light therapy has arrived and it is here to stay and it is not long until it will be accepted by every medical men as the one greatest modality in the prevention and treatment of disease. The infrared section of the spectrum of radiation covers many times the wave length values of any other section and in the near future it will be recognized the greatest section as an agent of metabolism correction. And when the matter is sifted to its final analysis, improper metabolism probably stands first as the true etiological factor in disease.

The careful physician will watch with great interest the development of this modality.

The series of infrared appliances for the use of the genitourinary specialist consists of a set of three sizes of infrared rectal dilator irradiators; one infrared prostatic irradiator; one colonic infrared irradiator; three sizes infrared urethral irradiators.

In addition the various sizes and types of external applicators can be used over the various foci, as for instance, over the perineum, the pubes, and the ovarian region.

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Unilateral Bifid Ureter, With Duplicate Ureter and Ureterocele on Opposite Side

By FRANK A. ROBERTS, M.D.,
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Ureterocele, ureterovesical cyst, or cystic dilatation of the lower end of the ureter was considered a rarity before the days of cystoscopy. Before 1905 only fifty-two cases were reported in medical literature, the greater number having been found postmortem, or during vesical operations. The vesical end of the ureters are dilated into a pendulous pouch filled with urine which remains *statu quo* if of long standing. If of recent formation there is a ballooning effect, which deflates and inflates, inflating with each influx of urine from the kidney and slowly deflating as the urine escapes through a pinhole ureter opening, usually situated on the most prominent part of the cyst. In my case, however, the supernumerary ureter orifice was found on the floor of the tumor after removal and was not of the pinhole variety, but a fairly large aperture. Calculi are sometimes found in these pouches.

These ureteroceles or cysts give a glistening pearl gray appearance, with bloodvessels coursing through the external surface. Cystic dilatations of the lower end of the ureter must be differentiated from ureteral prolapse which it most closely simulates. The two conditions are frequently mistaken for each other. Some textbooks do not differentiate between the two.

Prolapse of the lower end of the ureter is an acquired condition and is usually due to inflammatory causes. There are two kinds of prolapse, one of the mucosa alone (as after passage of stone) and one of its entire ureteral wall. In prolapse the ureteral orifice is not contracted as in ureterocele, but is dilated and the ureteral mucous membrane protrudes through the enlarged orifice. In ureterovesical cyst the delicate bloodvessels can be seen coursing over the surface. Occurring at all ages, in infants as well as in adults, seems to clinch the congenital theory.

Other abnormalities, such as hypospadias, cleft palate, and duplicate ureters, are often associated with ureterocele, and at times are bilateral, as reported by Portner.

These cysts may become so large so as almost to fill the bladder and protrude from the urethra causing intense tenesmus and hematuria.

ORIGIN.

Some cases are inflammatory in origin, these being in the minority, while the majority are undoubtedly congenital. The great majority seem to be due to a stenosed ureteral orifice which, undoubtedly, was congenital. In my case, however, the orifice was quite large.

DIAGNOSIS.

The diagnosis was made by means of the cystoscope. Inspection might reveal a minute punctiform meatus which cannot be catheterized, even with the smallest filiform. The ureteral meatus is situated on the side or summit of the swelling, and is so stenosed as to present a pin point orifice, between contractions the cyst collapses, and if the meatus becomes occluded destruction of the kidney follows. If the cyst is of long standing it may be found distended at all times, independent of contraction. Catheterization of a ureterocele may be difficult or impossible. At times it is followed by a steady stream of urine indicating retardation in a dilated ureter and pelvis.

The symptomatology of ureterocele varies according to the degree of its advancement and length of time of its existence. It may exist for some time without causing symptoms. The symptoms are usually renal, while bladder symptoms are secondary to infection. The dull, lumbar pain and reflex groin pain may simulate hydronephrosis, and if infection takes place, pyonephrosis. Some authors state that the cyst is composed of two layers of mucous membrane, that of ureter and bladder with fibrous or muscular tissue intervening.

TREATMENT.

Suprapubic or endovesical operation is always indicated, due to hydronephrosis or pyonephrosis. The former is usually present and less often the latter; both conditions are destructive to the kidney. Hydronephrosis is caused by pressure and pyonephrosis by destruction of the parenchyma and general infection.

The suprapubic operation consists of slitting the cyst and suturing the two layers, or complete resection of cyst with circular suture of mucous membrane. The endovesical operation is the one of choice, due to the improved endovesical technic. When endovesical operations were first used, some of the methods were successful and others were not. One method was to produce dilatation with ureteral bougies and catheters up to 12 F. and leaving them *in situ* for twenty-four hours, but this method often failed as recontraction took place. Sometimes the small meatus was slitted with cystoscopic scissors, and then dilated, biting off pieces of cyst wall with Young's cystoscopic rongeur. The following endovesical improved technic proved successful in my case, viz., the use of the D'Arsonval current as applied to bladder tumors.

URETER ANOMALY.

In doing ureteral work we should be on the lookout for anomalies of the ureters and kidneys. The unwary may be misled by finding the ureter orifices in normal position with functioning ureters. The supernumerary orifice being in some other part of the bladder hidden in the rugæ or trabeculæ of the vesical mucosa, or the ectopic opening of the aberrant ureter may be in the vagina or urethra, which makes it difficult to locate. In my case the supernumerary ureteral orifice was on the floor of the ureterocele, and was not discovered until the removal of the tumor, by the D'Arsonval current.

With our advanced diagnostic procedures it is possible to determine with accuracy the anomaly presented in this article, which, before the days of cystoscopy, were only found postmortem. This condition is one which confronts urologists in the proportion of about one to four.

A fused or double kidney usually accompanies a double ureter, and naturally permits of conservative surgery. Braasch says that when a double ureter is found, there is always a double pelvis and duplication of the kidney as well. Papin also states that even in unilateral duplication of the ureter, the pelvis is always doubled. Schwartz contradicts this, and Delmas is of the same opinion as Braasch and Papin.

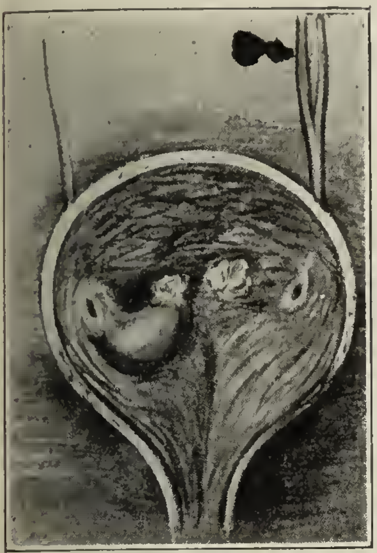
Fig. 1.

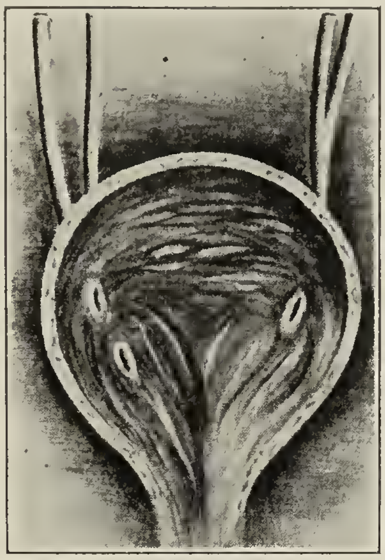
Fig 2.

Fig 1.—Shows ureterocele on right with normal ureter opening above; strawberry growths on summit, and a papilloma on bladder wall.

Fig. 2.—Shows the third ureteral opening after removal of the ureterocele.

A double ureter may unite at any point between the kidney and bladder and terminate in a single tube with a normally situated ureter opening in the bladder. Again when two openings are present in the bladder, the duplication is complete and ureters go to each segment of its kidney respectively. The lower segment is usually the larger and seems more prone to infection, whether because it is the shorter I do not know.

This anomaly of duplication of the ureter, according to Braasch, has no clinical significance of itself. It is only when some complication occurs that the recognition becomes of surgical and clinical importance. In the presence of such an anomaly, complications arise. It is, therefore, all important that the diagnosis should be made, which is possible today with our improved instruments and technic.

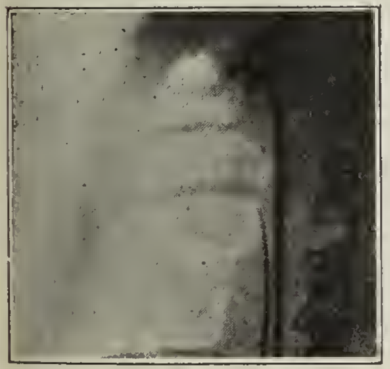
Fig. 3.

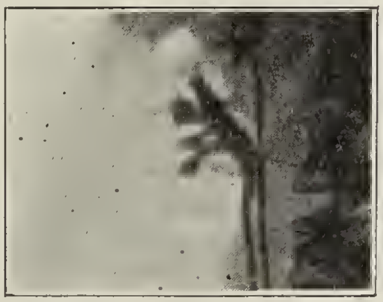
Fig. 4.

Fig. 3.—Shows pyelogram of upper and smaller segment.

Fig. 4.—Shows pyelogram of upper and lower segments.

The duplication may be unilateral or bilateral—but mostly unilateral. My case gave no symptoms referable to the left side and on cystoscopy showed the left ureteral orifice in normal position. The symptoms were pain over the right kidney and reflected to the groin with a previous history of cystitis. It is necessary for the up to date cystoscopist to have in mind these anomalies of the ureters and kidneys and be prepared with proper instruments, also up to date, backed with the knowledge of proper technic. Cystoscopy also revealed a tumor on the right side, the size of a hen's egg, which proved to be a ureterocele.

The condition is diagnosed by cystoscopic inspection—x ray, catheter, and the pyeloureterogram. If only one ureter opening is seen and is normal in appearance and position, the duplication is incomplete, by which I mean that the duplication takes place above the bladder, and the lead catheters, therefore, alone, will not make the diagnosis. A pyeloureterogram must be made. The duplicated orifices may be obscured by some pathological condition and will be found only after the removal of this, as was my experience, the supernumerary orifice on the right side was hidden by the ureterocele and was found only after its removal (Figs. 1 and 2). Therefore, the duplicated orifices are not always seen at the normal site. The two apertures may be in normal position and the supernumerary meatus in some other portion of the bladder or even in the urethra or the vagina, as previously stated.

Catheterization of the ureters is not difficult when only two apertures are present; the presence of a third or fourth makes it difficult with the ordinary catheterizing cystoscope, which must be introduced in the usual way with catheterization of one ureter and reintroduced for catheterization of the other two. Braasch has constructed a guide for the simultaneous catheterization of three ureters.

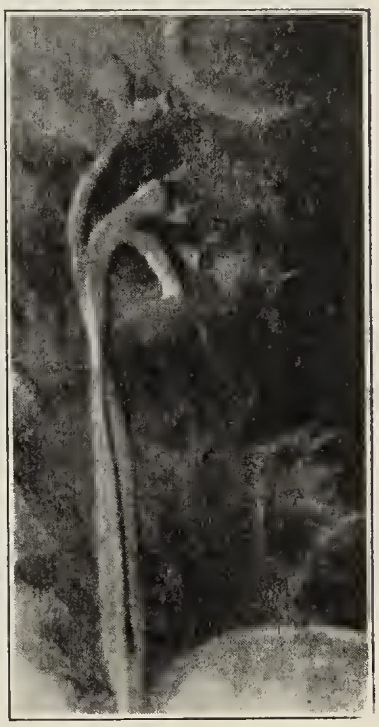
Fig. 5.—Shows double bifid ureter and double pelvis on left. The ureter bifurcates above the brim of the pelvis and a single ureter opening in bladder.

Functional tests of each segment can and must be done. Duplication may be confined to the kidney pelvis or to duplicate pelvis with separate ureters opening into the bladder (Braasch). Complications from duplication of the pelvis and ureters are hydronephrosis and pyonephrosis, tuberculosis, and stone. The most common is hydronephrosis and is due to obstruction.

It is not necessary to withdraw the ureteral catheter to the lower end of the ureter to make a diagnosis of the anomaly of a partial duplication of the ureter. The ureteropyelogram in this article will bear proof. It can be plainly seen that the x ray catheter is in the right branch of the kidney pelvis and the catheter is absent from the left branch. Yet both ureters are equally filled with pyelographic medium.

As to the duplicated pelvis, they may or may not communicate. This point can be determined by the methylene blue test. Functional tests of the duplicated segments are necessary, particularly when infection is present, to ascertain if heminephrectomy should be done. The pyelogram will show the distance between the two pelves, also their relative size.

CASE.—Miss A. K., aged thirty-six, was referred by Dr. Van S. because of a relapsing cystitis, pain in right kidney area, and reflexed pain to the right groin. Symptoms were of three months' duration; frequency by day seven to eight times, and twice at night. There were gastric symptoms. Physical examination was negative, except for the renal pain with reflex; no tenderness over either kidney, and no rigidity in costovertebral angles. Vaginal (bimanual) examination was negative, a discharge with pus cells was noted and a sterile specimen of urine obtained by catheter showed a specific gravity of 1.012, albumin negative, sugar negative, and an occasional pus cell.

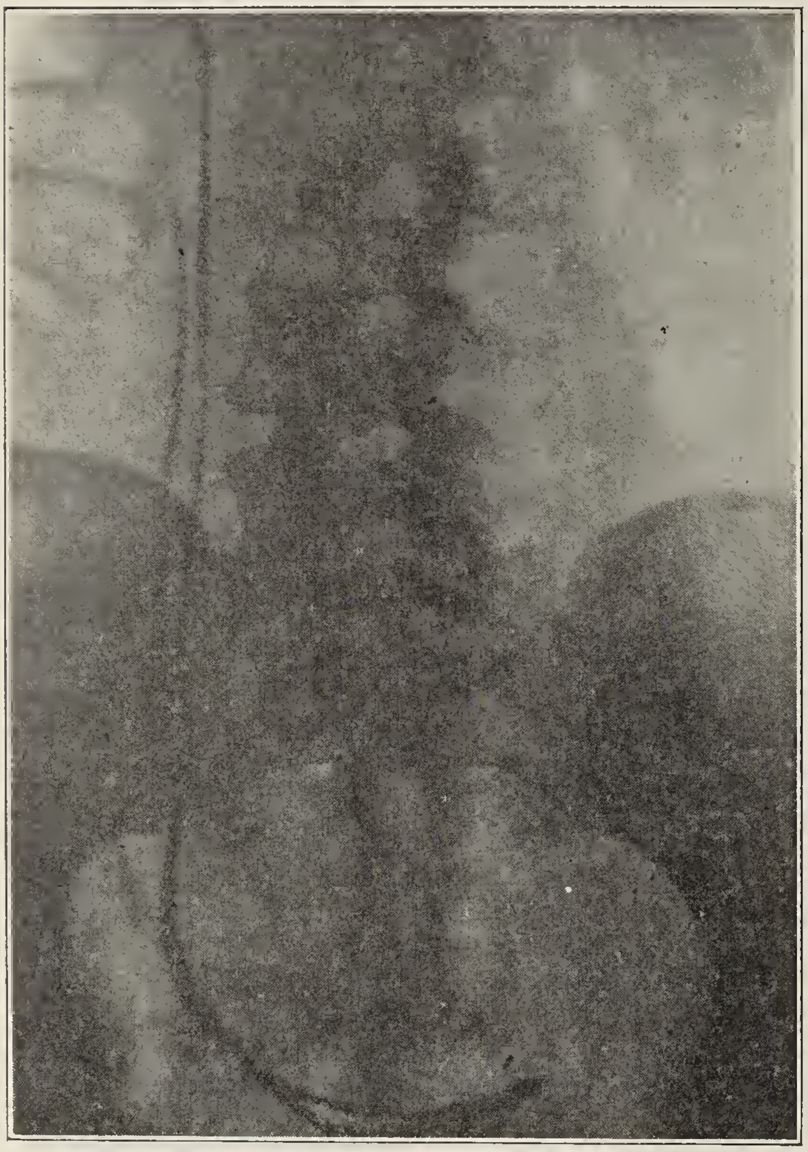

FIG. 6.—Shows catheter to each kidney segment after the removal of ureterocele; the opening of the second ureter was on the floor of the tumor.

Cystoscopy revealed evidence of old cystitis in the bladder mucosa. At the end of the ureteral ridge, just below the right ureter orifice, was a transparent tumor the size of an egg, which on close observation seemed to inflate and deflate. An area of erosion the size of a strawberry appeared on the summit of the tumor which bled easily and all attempts to find an opening on the summit of this growth failed. To the right of this growth was another small papilloma and also at margin of right normal ureter. Left ureter opening was normal in appearance and position.

Lead catheters were passed without obstruction to pelves of kidneys, and specimens collected for examination. Phthalein was injected intravenously; appearance of the dye, right three minutes, left three minutes, collection for fifteen minutes. Left kidney secreted twice as fast as the right. Pyelogram right five c. c., left twelve c. c.

Pyelogram showed on left side a bifid ureter and two distinct pelves—ureter bifurcates above brim of pelvis. Intravesical operation was performed for the removal of the tumor with the high frequency current. The tumor was well blanched and punctured.

The next sitting showed the walls of the tumor crater fashion, with opening on the floor, catheter inserted about ten centimetres. The walls of the tumor were sparked even with the bladder mucosa and the bladder irrigated with solution of silver nitrate.

The patient was told to report for further x ray and cystoscopy. The catheter was passed up each ureter opening on the right side to each kidney pelvis. The normal ureteral orifice was normal in size and position, the ureteral opening on the floor of the tumor was the larger of the two.

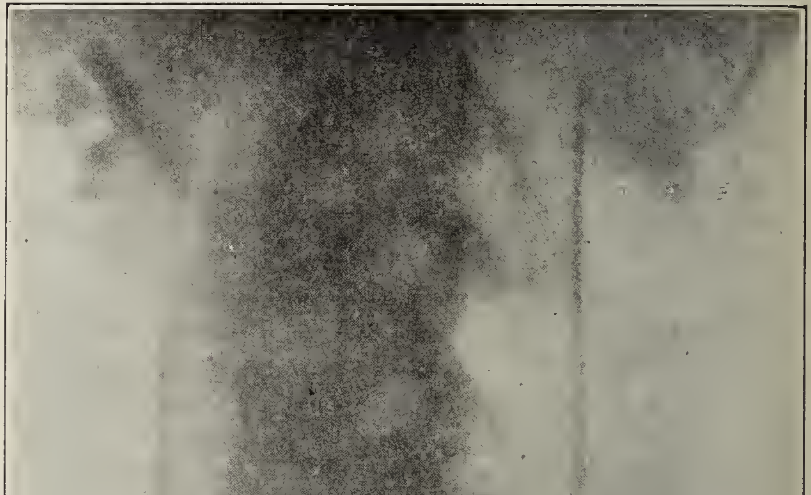

FIG. 7.—Showing pyelogram of lower segment of right double kidney and lead catheter without pyelograms on left. The small pelvis on the right suggests at once a double kidney. This plate was taken before the removal of the bladder tumor as seen in Fig. 1.

Specimens were collected from each segment; lower, cloudy; upper, clear. Pyelography of upper segment 10 c. c., lower segment 26 c. c. Radiogram shows catheter to each kidney segment respectively—the upper is the smaller of the two. Slight infection of lower segment and dilatation from inflammation. Cultures and stains were negative for bacteria. Direct smear negative for tuberculosis. Phthalein on right, eleven per cent. Operation (heminephrectomy) was not considered; patient improved, pains disappeared, there was gain in weight, appetite good, frequency disappeared. Patient is still under observation.

The diagnosis was bifid ureter on the left. Duplicate ureter on the right with ureterocele papillomata of bladder and right ureteral orifice. Two distinct kidney pelves on left and two distinct kidney pelves on right with beginning hydronephrosis in lower right segment.

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90 Clinton Avenue.

An Unusual Case of Stone in the Bladder

By H. HALLARMAN, M.D.,

New York.

The following case is worth reporting, I believe, as it presents unusual features:

Case.—Mrs. R. M., aged twenty-three, consulted me on June 1, 1923, complaining of frequency of urination. Her family history was negative. As a child she had had measles, whooping cough, and chicken pox, from all of which she had made a good recovery. She never had had scarlet fever. Menstruation began at the age of thirteen and had been regular since. She had been three months married and her last menstruation was ten days ago. She never had had any vaginal discharge and no pain on urination. Her habits were good, she did not drink tea or coffee to excess, her appetite was good, bowels were regular, and she slept well at night.

About three years ago she applied for a life insurance policy and was rejected because of something wrong in her urine. She consulted several physicians who told her that she was suffering from kidney trouble and put her on a special diet. It was then that she became aware of the fact that the frequent urination that she had noted for so long was not a natural thing. Although she had seen no improvement she still kept up with the special diet. None of the physicians whom she consulted gave her a physical examination or suggested any radiological examination. Her husband, who brought her to me, I knew to be free from any venereal disease.

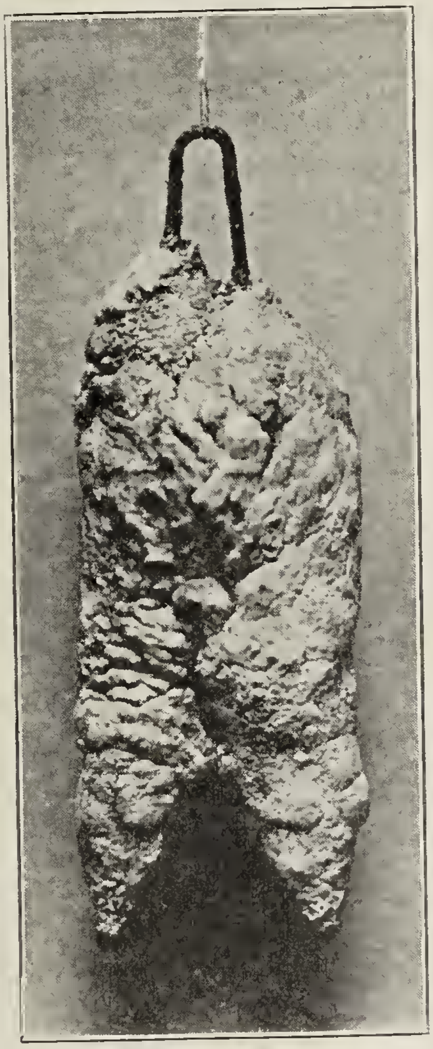

Fig.—Hairpin removed from bladder of patient. R. M.

Physical examination: Patient was a young woman twenty-three years of age, poorly nourished, skin clear, no edema anywhere, nothing abnormal in the head, neck, chest or abdomen, and no pain or tenderness over the kidney region.

Vaginal examination: A hard mass could be felt through the anterior wall of the vagina, and on bimanual examination it felt as if it was in the bladder. It was movable anteroposteriorly but not from side to side. No pain was elicited during the examination. The urine passed while in the office was turbid, bloody in appearance, specific gravity 1.022, albumin positive, reaction alkaline, sugar negative, indican normal.

Microscopical examination: Red blood and pus cells in abundance, no casts. Blood pressure was 124-80.

I made a diagnosis of a stone in the bladder. A cystoscopic and radiological examination by Dr. R. L. Dourmashkin corroborated the diagnosis, but it also showed a hairpin running through the centre of the calculus. On June 7, 1923, a suprapubic cystotomy was performed under nitrous oxide oxygen anesthesia by Dr. G. Warren. After freeing the free end of the hairpin from the posterior wall of the bladder the stone was removed. It weighed thirty grams. The calculus had formed around the ends of the pin resembling a huge bicuspid tooth, the head of the pin projecting free for a distance of one and a half centimetres. The whole stone was eight and a half centimetres long, three centimetres wide, nine centimetres circumference, two and a half centimetres at the points. Chemically it consisted of natural calcium phosphate and calcium oxalate. The patient made an uneventful recovery.

Comment: The pin must have been introduced into the bladder when she was a child, probably during masturbation. The size of the stone and its hardness leave no doubt that it had been there for many years. A physical examination, cystoscopy, and a radiological examination would have disclosed the nature of disease long before.

Editorial Articles

INDUSTRY AND VENEREAL DISEASES

The relation of venereal diseases to the industrial worker is treated in an article by Dr. J. J. Heagerty in a recent number of the *Canadian Public Health Journal.* Industrial physicians have estimated that the incidence among workers in industry of these diseases is from two to ten per cent., but, when intensive and systematic investigations have been conducted, these have shown that the rate is really higher. The ratio of gonorrhea to syphilis among laboring men has been found to be about four to one. That injuries are a precipitating cause of paresis in syphilitics has been generally demonstrated, and this fact should be realized and looked for in diagnoses of such cases. The nervous and cardiac forms of syphilis are the most dangerous, not only to the individual affected, but also to those with whom the syphilitic comes in contact in his work, if it be of a nature at all hazardous, such as that of the railroad engineer, the motorman or chauffeur, or the elevator operator. Such work demands oftentimes quick thinking followed by decisive action, and, since alertness and precision are greatly diminished in the syphilitic, the liability to accident is correspondingly increased. These forms of syphilis progress insidiously during the period of socalled latency, and so are frequently not recognizable until far advanced.

The article concludes with a plea that employers realize the great economic and vital loss from these diseases, and the highly beneficial results to be obtained, both for themselves and their employees, from periodical health examinations of workers. Laborers should also be instructed as to the dangers of the venereal diseases and the necessity for immediate treatment when such a condition is in its incipiency.

THE PRINCIPLES AND LAWS OF THE METHOD OF CLINICAL OBSERVATION

The principles of method of clinical observation were enunciated nearly twenty-five centuries ago by Hippocrates in the following celebrated passage: From the very onset examine the resemblances and dissimilarities with the state of health, the most considerable from their effects and the easiest to recognize, and which furnish all the means of observation; search for what can be seen, touched and heard; that which can be perceived when looked fo touched, smelled or tasted, and by using one's intelligence; lastly, that which can be made known by all known means.

What lends a real value to these precepts is that they are not merely the advice of a rhetorician but are the result of a long life of experience. Thus in treating the diagnosis of dislocation of the shoulder, Hippocrates insists on this elementary general medical rule which is invariably true, that one should "compare the healthy limb with the injured one in order to ascertain if that on the healthy side is dissimilar from that of the injured side," and he further says: "This is undoubtedly good advice but it can easily induce to error, which proves that it is not sufficient to know medicine theoretically, but that one should become familiar with this art by practice."

Therefore it is evident that facts, and facts only, interest the physician of Cos for he says: "The discourses and researches from which everyone should have for objects only those diseases from which everyone suffers." Besides, the physician should know what diseases arise in viscera, which are within, and which outside the body. He should also, in order to study human nature, "carefully ascertain the relations existing between man and his food and drink, his kind of life, and what influence each of these exercises on him."

Hippocrates likewise refers to the effects of baths and exercises and particularly reviews the action of seasons, winds, waters, soils and climates on disease. He points out that for him "the best physician is he who knows how to foresee" as "he will treat disease all the better when he is able by the present condition to foresee what is to come."

Hence, according to Hippocrates, medicine should be the study of 1, diseases themselves, their symptoms and sites; 2, their causes; 3, their evolution, prognosis and treatment. The three operations of Hippocratic observation have each their intrinsic value, as well as their own peculiar faults which are to be avoided.

If the knowledge of signs in the description of disease is an essential and necessary notion, it is clear that their endless subdivision—by multiplying details—tends to confusion. This is why Hippocrates rightly reproaches the physicians of Cnidos who "wishing to characterize the varieties of each disease with exactitude have gone astray."

The determination of the causes of disease is likewise an operation of great value but on the condition that one reasons on facts and realities and not on hypothetical estimates or imaginary generalizations. It is precisely this defective reasoning that Hippocrates brings into relief in all who have attempted to discourse upon medicine taking as a basis: "the hypothesis of either hot or cold, moist or dry or any other agent of their choice." And he adds: "They simplify things but are all the more to be blamed because they deceive themselves."

Finally prognosis is a fundamental operation of the medical mind and Hippocrates especially insists on this point and again points out that "he who would learn to conjecture properly what affections are recovered from and those with a lethal outcome, those which last a few days or a longer time must judge all things by the study of symptoms and by the comparison of their reciprocal value."

These symptoms as described in the treatise on prognosis are derived from the aspect of the patient's face and his position in bed, fever, sleep or delirium, pain, respiration, vomiting and sputum, the urine and feces as well as examination of the throat, thorax, abdomen, etc. All this requires special care on the physician's part, and Hippocrates blames the physicians of Cnidos who are content with simple data furnished by the patients themselves in reference to their illness. Hippocrates points to the fact that the ancients wrote nothing on diet which he regards as a serious omission. Hence he enters into great detail of food, especially the decoctions of barley—recently brought into modern therapeutics by Springer and others—and the methodical use of drinks, among which figure sweet, strong, white and red wines.

SURGICAL TUBERCULOSIS AND THE WASSERMANN REACTION

When one reads the classical descriptions, the diagnosis of bone, joint and lymph node manifestations of tuberculosis would seem to be an easy matter or at least possible to make in the average case. Nevertheless it not infrequently happens that a symptom, localization, a sign found in the general examination of the subject or the evolution of the affection do not correspond to the ordinary clinical picture of tuberculosis and lead one to suspect syphilis. But here again the clinical differentiation between the bone joint and lymph node manifestations of tuberculosis and syphilis is difficult and it has been this difficulty that has led of late to resort to the Wassermann reaction.

At Berck-sur-mer, Pouzin and Stroehlin have recently used the Wassermann in two hundred and twelve children presenting lesions of the joints, bones or lymph nodes which they classify under three headings. The first group comprised children offering stigmata of congenital syphilis and a close study at the hospital resulted in a diagnosis of syphilis before the laboratory result was known. The second group comprised children whose affection presented one or several symptoms which did not correspond to the ordinary clinical picture of tuberculosis. They were cases of suspected syphilis. The third group was made up of patients whose local or general clinical examination gave rise to no suspicion of syphilis; they were regarded as cases of confirmed tuberculosis before having been submitted to the Wassermann test.

The Wassermann made in the three groups gave the following results. In the first group there were twenty-one positive and four negative, otherwise eighty-four per cent. positive results. In the second group there were fifteen positive and forty-nine negative, otherwise 29.4 per cent. positive. In the third group there were eight positive and one hundred and fifteen negative, otherwise 6.5 per cent. positive.

In the patients of the first group, the Wassermann test allowed one to begin or to continue antisyphilitic treatment. In the second group it allowed one to affirm syphilis in fifteen cases in which it could only be suspected. Finally, in the third group, which clinically appeared to be entirely tuberculous cases, the Wassermann was the only means of detecting syphilis, a diagnosis which afterevents confirmed and led to an appropriate treatment followed by a rapid recovery.

The Wassermann reaction should be closely united to the clinical diagnosis of surgical tuberculosis. By this means a clinically certain diagnosis can be verified, signs leading one to suspect syphilis can be confirmed while errors in diagnosis are revealed. In some cases that are impossible to diagnose clinically, it may be the means of indicating the veritable origin of the affection.

ARCUS SEMILUNARIS OF THE NAILS AS A DIAGNOSTIC SIGN OF SYPHILIS

It may be well to draw attention to a diagnostic sign first described by G. Milian of Paris, in 1913, which consists of a rose red semicircle conforming in outline to the free edge of the fingernail and four to five millimetres behind it, when the nail is pared close. Its concavity similarly accords to the lunula. The convexity is sharply defined, the concave margin more blurred. It is one half to one millimetre thick. It is frequently separated from the lunula by a white semicircle which makes it evident. It is more common on the middle and ring fingers, less so on the thumb, and it may be present on both hands.

Unlike other lesions of the nails it does not shift with their growth, the reason being quite simple, it merely being that the sign is the result of a deposit of treponemata in the capillary circulation at the point of insertion of the nail upon the subjacent derma where this is, so to speak, a capillary dead end. Active antiluetic treatment will cause it gradually to retrogress if sufficiently prolonged but it will survive the transformation of a positive to a negative Wassermann reaction. In ten years Milian has not noticed this sign in other than syphilitic subjects and has met with it in the third or fourth year of the infection in persons who, before contracting syphilis, were free from it. This sign may appear during the first year of the process but is more prone to arise in neglected cases. It also develops in congenital syphilis.

As to the application to diagnosis, Milian cites the case of a patient with a preputial sore and papules. Every evidence of an ulcus molle was present and none of syphilis; even the Wassermann reaction was negative. However, the patient clearly showed the nail sign. Under antisyphilitic treatment the papules healed in four or five days and the sore in a couple of weeks, although it had existed that same length of time with no sign of remission before the patient applied for treatment. The nail sign is an indication of active syphilis and therefore of the need for active treatment. To cause the sign to disappear will, in most instances, require some eight months.

VENEREAL DISEASE CONTROL IN THE STATES

In the recently published transactions of the Twentieth Annual Conference of State and Territorial Health Officers with the United States Public Health Service, held in Washington in 1922, the program for the State control of venereal diseases proposed and approved is given in full. One point emphasized was the value of devoting considerable thought, energy, intelligence and supervision to the question of interesting private practitioners throughout the country in venereal disease control and of endeavoring to see that these doctors give better treatment to such cases than they have done in the past. The belief was expressed that ninety per cent. of such cases would be treated by general practitioners, not by specialists. It was also urged that the importance of the social side of venereal disease should be emphasized, as this phase is not appreciated at the present time. The principal methods of doing this would be to ascertain sources of infection and to inaugurate efforts to prevent the spread of the diseases.

It was agreed that the work of the divisions of venereal diseases in the various State boards of health should be linked up with the work to be done in each State under the terms of the Sheppard-Towner Act. Just how to accomplish this linking up of venereal disease control with infant and maternity welfare work would be something for each health officer to work out for himself. Another point agreed upon was that every effort should be made to develop the control program as a local, community responsibility. Each town and county of every State should bear its own financial burden and provide treatment for infected persons, and should carry on its own preventive, protective, and educational work, just as it does in the case of the other communicable diseases, as a part of the work of the bureau or division of communicable diseases. In this connection it was recommended that more attention be paid to the sources of infection, especially houses of prostitution. Health departments must assume certain responsibilities in connection with eliminating vice conditions in the community if syphilis and gonorrhea are to be treated like other communicable diseases.

Recommendation was made that a vigorous educational campaign for informing the public should be carried on, with more definite emphasis upon venereal diseases than has been the case in the past. This should be extended to the schools, through cooperation of the State boards of health and education, which should furnish exhibit material, lectures, and other kinds of instruction of the proper kind. Another fertile field for extending public education on the subject would be through the many institutes and conferences of laywomen held annually in all the States, and the social hygiene conferences throughout the country.

It was announced that the conditions of receiving the allotments from the Government for the work in the States are that an equal amount must be appropriated or otherwise set aside by the State and evidence furnished that this has been done, and that a budget must be prepared and forwarded to the Public Health Service showing the manner in which it is proposed to expend this joint fund, after which the quarterly allotments will be paid in advance.

THE NEW YORK INFIRMARY FOR WOMEN AND CHILDREN

The recently issued annual report for 1921 of the New York Infirmary for Women and Children covers the sixty-fourth year of its existence. The first annual report, a small and modest document issued in 1855, tells of a hard struggle under heavy financial odds to establish a hospital where medical women could obtain training, and where destitute and friendless women could have help and care. In 1853, a small room in a poor quarter near Tompkins Square was rented and a dispensary opened. Later this establishment was moved to Third Street. In 1857 a step in advance was made by renting a house at 64 Bleecker Street, which was equipped as a hospital for the reception both of patients and of young assistant physicians. This institution, under the name which it now bears, was opened formally in May, 1857, by the Rev. Henry Ward Beecher. The New York Infirmary for Women and Children holds the honor of being the first hospital in this country dedicated to the service of women and children and the training of women physicians. In the early days when the founders, Dr. Elizabeth Blackwell and Dr. Emily Blackwell, saw the first need for such an institution, they were told, to quote from the former's book, *Pioneer Work for Women,* that "female doctors would be looked upon with so much suspicion that the police would interfere; that if deaths occurred their death certificates would not be recognized; that if any accident occurred, not only the medical profession but the public would blame the trustees for supporting such an undertaking; and, finally, that they would never be able to collect money enough for so unpopular an effort." To quote from the 1921 report: "The world has moved a long way since then. In the year 1921 . . . the institution cared for 1,672 sick women and children. The outpractice of the infirmary showed 4,572 visits. The maternity service, which has possibilities of becoming one of the largest maternity services in the United States, cared for 452. The prenatal clinic was begun more than thirty years ago. This work is now being introduced into various districts of the city by the Board of Health. So runs the tale of one of the most courageous and successful pieces of pioneering ever accomplished by men or women."

NEW BUILDING FOR JEFFERSON HOSPITAL

The latest annual report of the Jefferson Hospital in Philadelphia announces the completion of plans for a new fourteen story addition now under construction. The site is that of the old hospital, which has been used for the last several years as a nurses' home. The plans call for the most modern type of building, with all the best and latest specifications for hospital construction. There will be three surgical operating rooms and two delivery rooms on the fourteenth floor, with a surgeons' dressing room, anesthetizing rooms, nurses' work rooms, and a sterilizing room adjacent to the operating rooms. The eighth, ninth, tenth, eleventh, twelfth, and thirteenth floors will contain each nineteen private rooms, and a service room, diet kitchen, and nurses' office. The third, fourth, fifth and sixth floors will be used as quarters for pupil nurses until a new nurses' home can be built. The plans of these rooms will be such as to make them convertible when necessary into rooms or wards for patients. On the second floor will be located additional x ray rooms, the dental clinic, and the bronchoscopic clinic. The first floor will contain offices, a staff room, the social service department, and occupation therapy rooms. The clinical amphitheatre will occupy part of the basement and the first and second floors, and will have a seating capacity of five hundred. The basement will contain also an anesthetizing room, surgeons' dressing room, sterilizing room, and the neurological, orthopedic, clinical medicine, and gastroenterological outpatient departments. There will be an enclosed roof garden on the top of the fourteenth floor.

IN MEMORIAM: WARREN G. HARDING

President of the United States, 1920-1923.
Honorary Vice-President of the National Tuberculosis Association, 1921-1923.

By S. Adolphus Knopf, M. D.

Obituaries by the thousands have been written for American and foreign newspapers on the death of one of the most beloved, honored, and distinguished Presidents of the United States. All have emphasized the unusual qualities of Warren G. Harding as a man, a statesman, and a lover of his kind. His splendid physical appearance, his congeniality, his warm heartedness and his sympathy with all great and noble causes, have won him countless friends and admirers.

All this has been well expressed by the public press; but strange as it may seem, in no one of the obituaries has there been any mention of the great and special interest President Harding took in medicine. Nevertheless, one might say that he belonged to a distinctly medical family; his father, brother, and nephew are successful physicians and there can be no question that the personal qualities this great man possessed were those which would have made the ideal physician. Of Warren G. Harding's boyhood an unknown biographer said: "He was just a natural, healthy, robust boy, endowed with the supremest gifts of nature—good, hard common sense, a rugged constitution, a sunny disposition, and a heart full of the milk of human kindness." What better foundation and qualifications could there be for a medical man? But, of course, it was fortunate that young Warren should have chosen the career which made him one of the greatest Presidents of the United States and now his loss is felt throughout this country and the civilized world.

From his humble home in Marion and the time when he printed his own home newspaper until he reached the exalted position of the first executive of the Republic, President Harding kept his inherited love for medicine, his admiration for medical science, for our great specialists, and, above all, his genuine appreciation of the service rendered by the general practitioner as family or private physician. He took with him to Washington his own family physician, Dr. Sawyer, and honored him by conferring upon him the rank of a Brigadier General. An equally gracious act, showing what the President thought of the value of a medical man as an ever ready adviser and friend in time of illness and showing also the greatness of the man, Harding, and his sympathy for the sick and suffering, was manifested in the following incident: At the time of President Wilson's retirement from office, it is now well known that he was a seriously ill man. Admiral Grayson was Mr. Wilson's private physician and that the invalid might not be deprived of this valued medical adviser, one of President Harding's first official acts was an order that Admiral Grayson should not be assigned to any duty which might demand his leaving Washington and giving up the care of his illustrious patient. This was unknown to ex-President Wilson and unknown to the outside world, and only now, after all that is mortal of President Harding has been laid at rest, do we learn of this touching incident.

To the tuberculosis workers and sanitarians, the late President was very close indeed and he expressed his deep interest in these subjects publicly on more than one occasion. On September 27, 1921, after having presented a silver cup to the children of the District of Columbia, in the intercity contest of the Modern Health Crusade, the President wrote to Mr. Charles M. DeForest, of the National Tuberculosis Association, as follows:

> My Dear Mr. DeForest:
>
> I was very much interested today in presenting, on behalf of the National Tuberculosis Association, the silver cup won by the school children of the District of Columbia because of their larger enlistment, relatively, in the Modern Health Crusade, particularly in their enlistment to make effective warfare against tuberculosis. I may quite sincerely express the hope that in every American city and country district a like large proportion of boys and girls will make themselves knights by faithful attention to their own habits and their care and concern for the health of the nation.
>
> Very truly yours,
> (Signed) Warren G. Harding.

This letter shows not only Mr. Harding's great love for little children but also his deep interest in their physical wellbeing and the health of the nation at large. In his love for little children and their welfare, the President had a most devoted sympathizer and helper in Mrs. Harding.

President Harding took a particular interest in the tuberculous exsoldiers and it is to him that we are very largely indebted for the energetic provision for the care and treatment of our sick and wounded exsoldiers now carried on so effectually by the War Veterans' Bureau.

On March 1, 1922, when learning of the contemplated publication of the History of the National Tuberculosis Association, he wrote to the author as follows:

> I am glad to receive your communication, with enclosures, and to learn that the National Tuberculosis Association has undertaken the publication of a History of the Antituberculosis Movement in the United States.
>
> My attention has been recently directed to the beneficent results achieved by the intensive antituberculosis effort, as evidenced by Dr. Frankel's paper at the annual meeting of the National Association last June. It is certainly gratifying to know that sixty thousand fewer deaths occurred in the United States Registration Area from pulmonary tuberculosis in 1919, than would have occurred if the 1900 death rate had prevailed. The knowledge of such impressive facts cannot fail to be an inspiration to all engaged in preventive medicine and in the mitigation of human suffering and distress.
>
> With all good wishes for the continuing success of your efforts, I remain,
>
> Yours sincerely,
> (Signed) Warren G. Harding.

Those of us who had the rare privilege of meeting the President at the annual meeting of the National Tuberculosis Association in 1922, will never forget the cordiality with which he greeted the many members who were presented to him. For each one he had a smile, a kind word, and a grasp of the hand.

Now we all bow our heads in sorrow for the loss of our great President who by word and example has shown us where our duty lies in future work. May his name be to us the symbol of duty and inspiration to go ever onward in the fight, not only against the great white plague, but against all preventable and curable diseases, and make the people of the country he loved so much the healthiest, happiest, and physically and morally strongest nation of the world.

News Items.

Health Expert Arrives.—Dr. G. Sanneman, in charge of the Public Health Service of the port of Hamburg, arrived in this country to spend a month studying methods of the United States health officers at the Quarantine Station, Staten Island. He said he would also inspect Ellis Island.

Voronoff to Bare Operation Secrets.—Dr. Serge Voronoff has accepted the invitation to attend the Second International Congress of Comparative Pathology, to be held in Rome, October 7th. Dr. Voronoff says he will then for the first time give the details, methods, and results of gland operations he has performed on forty-five men.

Dr. Maude E. Abbott Accepts Post.—Dr. Maude E. Abbott has accepted the chair of pathology and bacteriology at the Woman's Medical College of Pennsylvania. Dr. Abbott comes to Philadelphia direct from McGill University, Montreal, Canada, where she was the recipient of most of her world honors.

Fund for Child Health.—The American Child Health Association has announced the establishment of a $10,000 scholarship fund to be awarded to physicians now engaged in child health work for study in medical centres or for travel and observation of child hygiene work. The association has created two similar endowments within the last six months. The purpose of the third appropriation is to meet the growing demand for more and better trained physicians in the field of child hygiene.

Röntgen Ray Society Convention.—The annual convention of the American Röntgen Ray Society is to be held in Chicago from September 18th to 21st. A number of eminent foreign contributors will appear on the program, and the treatment of patients by high voltage x ray will have a prominent place on the program.

Applied Dental Science Annual Meeting.—The fifth annual meeting of the American Academy of Applied Dental Science will be held in Cincinnati, Ohio, January 7 to 9, 1924. All students of progress in both the dental and medical professions are invited to attend these sessions. For further information write Dr. E. F. Forestner, 104 Bell Block, Cincinnati, Ohio.

American Electrotherapeutic Meeting.—The American Electrotherapeutic Association will hold its thirty-third annual meeting September 18th to 21st at the Hotel Chalfonte in Atlantic City. All licensed physicians interested in physiotherapy are welcome. Of especial interest on the program will be a symposium on physiotherapy in general practise. Programs can be obtained from the corresponding secretary, Dr. Richard Kovacs, 223 East Sixty-eighth Street, New York City.

Medical College to Establish Clinic to Study Children.—A clinic for unruly children, the second of its kind in the world, will be established at Rush Medical College in Chicago. The new clinic at Rush will specialize in neurotic children between the ages of three and fourteen years. Its nurses and physicians will investigate home conditions first. The only other clinic in the world specializing in the behavioristic problems of children is in Boston.

International Union Against Tuberculosis Meeting.—The council of directors of the International Union Against Tuberculosis held its annual meeting in Paris on July 26, 1923, at the headquarters of the League of Red Cross Societies. Twenty members of the council from different countries met under the presidency of Dr. Dewez, of Brussels. The report of Prof. Besançon, of Paris, on the question of the "respective value of technics for research of Koch's bacillus for diagnosis of lesions in human tuberculosis" gave rise to an interesting discussion. A report of this discussion will appear in the next number of the *Bulletin of the International Union Against Tuberculosis*.

International Surgical Congress Meeting.—At the congress recently held in London, Dr. Davide Giordano, Venice, Italy, was elected president to succeed Sir William Macewen. The predecessors of Giordano in the presidency of these congresses were Dr. Kocher of Berne, Dr. Czerny of Heidelberg, Dr. Lucas Championnière of Paris, Dr. Depage of Brussels, Dr. Keen of Philadelphia, and Dr. Macewen of London. The *Riforma Medica* states that Giordano is the first president who is not connected with a university. The toast to the delegates at the annual banquet was acknowledged by Dr. Crile, for the United States; Dr. Koch, for Holland; Dr. Mayer, for France and Belgium; Dr. Alessandri, for Italy; Dr. Hansen, for Denmark; Dr. Kayser, for Sweden; Dr. Petridis, for Egypt; Dr. De Zawadski, for Poland, and Dr. de Quervain, for Switzerland. The next congress will be held in Rome and not in Warsaw as had been proposed.

Poor Will Get Insulin Free.—Persons in Ontario suffering from diabetes and unable to pay for insulin will be provided with the remedy free of charge by the Ontario government.

Academy of Medicine on Vacation.—It has been announced that the New York Academy of Medicine will be closed during the last two weeks of August in order that the building may be renovated. This is the first time, in at least thirty years, that the academy has been closed to the public so long.

Dr. Lowsley Sails.—Dr. Oswald S. Lowsley, managing director of "Diamond Jim" Brady's million dollar foundation for research in urology at the New York Hospital, sailed recently aboard the *Leviathan* to attend clinics in Paris, Vienna, and Rome, where he hopes to acquire new ideas in connection with operations that lead to rejuvenation.

Gouraud Decorates Dr. Harvey Cushing.—The medal of Chevalier of the French Legion of Honor was conferred upon Dr. Harvey Cushing, the Boston surgeon, by General Henri Gouraud during the French war hero's visit to Harvard University. Dr. Cushing received his decoration for his services in France in 1915.

Hail Insulin's Discoverer.—The members of the British Medical Association forgot their professional dignity and cheered heartily again and again for the young Canadian, Dr. F. G. Banting, of Toronto, when he was introduced to them to tell the scientists about his discovery of insulin for the treatment of diabetes.

Physician Undergoes Steinach Operation.—Reduction of high blood pressure and the retardation of arteriosclerosis can be accomplished by means of the Steinach rejuvenating operation, according to Dr. David Trumball Marshall, of Villard Avenue, Hollis, L. I., who admitted he had undergone the operation at the Central Park West Hospital.

Maternal Hospital New Building.—The Jewish Maternity Hospital has purchased four lots at the northeast corner of Fifth Avenue and 108th Street, where it plans to build a new twelve story hospital building, which, when equipped, will cost about $1,000,000, and provide 150 beds. Most of the necessary funds have been subscribed.

Hay Fever Clinic Opens in Brooklyn.—A new department of diagnostic research at the Victory Memorial Hospital, Seventh Avenue and Ninety-second Street, Brooklyn, has been established. It offers free scientific diagnosis to sufferers from hay fever, asthma and kindred ailments. Applicants, after expert examination, will be sent back to their family physicians for treatment.

Dr. Voorhees Publishes Book.—Dr. Irving Wilson Voorhees, who has a large medical practice among singers in New York, and who is adviser to members of the Metropolitan, Chicago and Century opera companies, has written a book on *The Hygiene of the Voice*, which Macmillan is to publish next month. The book has grown out of the author's experience in examining and treating singers and speakers, and in it he deals with the singer's problems especially from the point of view of the voice physician. Dr. Voorhees is assistant surgeon to the Manhattan Eye, Ear, and Throat Hospital.

LONDON LETTER.

(*From our own correspondent*).

London, *July 9, 1923*

CANCER AND CIVILIZATION.

Sir Arbuthnot Lane sent to the lay press recently, the following contribution on the cancer question, a question which owing to the vigorous public propaganda just launched in great Britain is arousing much interest among all classes of the community. Sir Arbuthnot says:

"It seems to me that the question of the causation of cancer has been rendered much more complex than is necessary. Nature has provided us with most definite evidence as to the cause of cancer, or, rather, as to the circumstances in which cancer does or does not occur. In native races in their normal surroundings cancer and the intestinal conditions which precede it are absolutely unknown. In civilization cancer and the associated intestinal conditions appear for the first time and are most prevalent. We believe that they are increasing with great rapidity, exacting a steadily increasing toll of human life. If the native is removed from his normal surroundings and habits and becomes a member of a civilized community, he is affected by cancer and the associated intestinal conditions with the same frequency as the white man with whom he lives. Indeed, the prevalence of cancer in the native varies directly with the degree of civilization in which he is thrown. Of the truth of this we have absolute evidence. It merely remains for us to determine the nature of the variations in the relationship of the individual to his surroundings which exist in the savage and in civilized man, and to endeavor by some means to approximate the habits and diet of the cancerous races to those of the cancer free races. An enormous amount of money has been expended in investigation of minute detail with practically little or no results. It is unfortunate that as a special sense develops one appears to lose one's common sense."

If the occurrence of cancer can be largely prevented by regulating the diet and habits of life so that intestinal conditions are such that they do not tend to act as exciting causes of cancer, these means of prevention ought to be encouraged. The prospects of grappling with cancer successfully are more hopeful now that the public is beginning to manifest an interest in the subject. It is well, therefore, that all aspects of the matter should be presented to the public in the lay press for it is only by these means that a general concern in all classes of the community can be effectively excited.

CAUSES OF SUICIDE.

Speaking on True Temperance at the 1912 Club recently, Mr. Danford Thomas, a well known London coroner, said that people were fond of saying that suicides were chiefly due to alcohol, but in his experience of twenty years as a coroner that certainly was not true. He found that suicides were more often due to lack of money and to domestic trouble. Sometimes these persons when in trouble took refuge in alcohol, but in the primary state he considered that alcohol was a very slight cause of suicide. It was one or two per cent., and not more. He knew of two medical men who, after having drunk heavily all their lives, suddenly became fanatical advocates of temperance, because they could drink no more.

UNIVERSITY OF LONDON.

At a meeting of the Senate of the University of London, on June 20, last, Mr. H. J. Waring, M.S., F.R.C.S., was reelected Vice-Chancellor for the year 1923-24. Professor Frederick Wood Jones, D.S.C., M.B., B.S. (Lond.) was appointed as from September 1st to the University Chair of Anatomy, tenable at St. Bartholomew's Hospital Medical College. Since 1919 he has been professor of anatomy in the University of Adelaide. Mr. R. J. S. McDowall, M.B., Ch.B., D.S.C. (Edin.) was appointed as from August 1st to the University Chair of Physiology, tenable at King's College. He has been lecturer in physiology at Edinburgh; and since 1921, he has been lecturer in experimental physiology and experimental pharmacology at Leeds. Mr. Gilbert Stead, M.A. (Camb.) was appointed to the University Readership in Physics, tenable at Guy's Hospital Medical School, as from August 1st.

CHILD WELFARE IN SCOTLAND.

In all parts of the civilized world child welfare is beginning to be estimated at its true importance. In an industrial country, as in the United Kingdom, it is absolutely essential that infants should be born and reared under as favorable conditions as possible, including antenatal care, because the well being of a country rests upon the physical and mental health of its workers. In a country such as the United Kingdom in which more than three quarters of its population live in towns densely inhabited, often greatly overcrowded, and in which a large proportion of the inhabitants are engaged in industrial pursuits, most of which are unhealthy in varying degrees, the problem of rearing infants and children in a healthy manner is of more importance and more difficult of solution than in any other civilized country.

Last month there was opened at Motherwell, near Glasgow, the Carnegie Child Welfare Centre and Maternity Home, which is intended to provide instruction in hygienic principles to those who are in charge of infants and young children. The cost of the building was borne by the Carnegie Trust and the equipment by the local authorities with the aid of Government grants. At the opening ceremony Sir Leslie Mackenzie, M.D., said that the reasons why Motherwell had been chosen for the experiment were its phenomenal rise in fifty years from a village to a town of seventy thousand inhabitants, its possession of a really active local authority, and its central position. If they had an education centre which was to be a visitation spot for the whole world, it must be a place easy of access.

THE SMALLPOX EPIDEMIC.

Smallpox is still prevalent in Gloucester and neighborhood and cases of the disease have been reported in Derbyshire and in other parts of the country. The type of the disease is mild, so mild indeed that many cases were undetected and no precautions taken to prevent the infection from spreading. However, every effort is now being put forth to curtail its dissemination. The epidemic at one place or another has been in existence since last autumn and affords a striking object lesson on the results of the neglect of vaccination.

As has been emphasized on more than one occasion in these letters, Great Britain, the land in which vaccination was discovered, is almost the only civilized country in which vaccination against smallpox is almost a dead letter. A loophole for the ignorant and indifferent to escape vaccination is provided by the conscientious objectors' clause of the vaccination act. Liberty is so greatly valued in this country that even the ignorant and careless must not be compelled to protect themselves and their children from a dangerous disease and what is of more consequence to avoid spreading it, because forsooth, they do not wish. The value of measures to promote good health is not appreciated and measures of a preventive nature are viewed askance and even with a certain amount of derision by the mass of the people.

In the past the medical profession has neglected its duty of teaching the public and does so still. In this country medical ethics stand in the way, for if a medical practitioner posed as a teacher of the public he would be stigmatized by his fellow practitioners as an advertiser and perhaps rendering himself liable to action by the Medical Council. And yet there should be means found to counteract the teachings of the opponents of vaccination, of medical research, of hygiene, and of many other methods which lead to good health and its maintenance. The public is taught many untruths concerning preventive and remedial medicine and it behooves the medical profession to devise ways of teaching the truth. The day is past for holding the view that many medical men still hold that medical matters should be discussed only in medical circles and societies. For the sake of the public as well as of the profession, a more broadminded view and one more in keeping with the trend of the times should be taken and the public should be made to know that good health is of greater importance than politics.

THE MINISTER OF HEALTH ON CANCER.

Mr. Neville Chamberlain, Minister of Health, on June 25th, last, made a speech in the House of Commons on health matters. He said that cancer was fourth on the list in England and Wales as regards mortality and accounted for about ninety-six in one thousand of all deaths from all causes. He was sorry to say that this disease was increasing among the English people. In 1900 cancer deaths to the million of the population were 829; in 1910 they had risen to 967, and in 1921 to 1,215. Two allowances must be made. The first was that methods of diagnosis were constantly improving. Then the fact that people lived longer than formerly brought a larger proportion of the population into that comparatively short span which was called the cancer age. Cancer was most prevalent between the ages of fifty and sixty. He had at the Ministry of Health a Standard Medical Committee on Cancer which advised him from time to time. Researches were being undertaken by three bodies, the Cancer Research Fund, the Middlesex Hospital and the Cancer Hospital. In addition the subject was constantly under the attention of the Medical Research Council and in the last few weeks another body had started, the British Empire Cancer Campaign. If that new body could succeed in cooperating with the existing bodies he, the Minister of Health, would be glad to give it his support.

VIENNA LETTER.

(From our own correspondent).

VIENNA, *May 13, 1923.*

HOW TO TREAT PATIENTS OF ADVANCED AGE.

Dr. Helmuth, lecturer on clinical medicine in Graz, read a paper on how to treat patients of advanced age, at a recent medical meeting. He said that the most important changes of advancing age affect the circulatory apparatus, as well as the vessels of the heart, and not infrequently the whole system is affected by an arteriosclerotic process. Naturally, the other organs and tissues also undergo the changes of old age. The most important of all pathogenetic signs is the failure of powerful reaction against external and internal damage. When all the other signs of fever are present there is no marked rise of temperature. With increasing age infective diseases give place to the diseases of tissue change that run a chronic course. The reason further lies in acquired immunity due to the cells overladen with products of tissue change affording an unfavorable soil. If infection occurs, as, for example, pneumonia, this runs in old age quite a different course from that in a young man. The rise of temperature is but slight, the sputum is rarely characteristic, the expectoration slight, the slight acceleration of respiration frequently the only objective sign of some disease of the respiratory tract. The changes in the central nervous apparatus due to the intoxication are foremost in importance, (mild delirium, etc.).

In old age almost all kinds of pathogenic bacteria may set up pneumonia. But the diplococcus decides the course rather than the form. In infective diseases, in the old, the excretion of noxæ through the kidneys, intestines and skin is arrested. A condition of chronic poisoning arises that manifests itself in increasing weakness, especially of the circulation.

In the matter of treatment, above all things the circulation must be excited. The equivalent of this is absolute rest; that position is the best that is the most agreeable. Further, warmed pure air must be provided, cooling of the body must be prevented by warm clothing, and the temperature of the room should be at least 180 C. Centripetal rubbings, friction with hot dry cloths, raising of the extremities influences the various stases, hot foot and hand baths with mustard, hot partial washing of the skin, moist partial packings are an important support. Warm baths in old age are less suitable on account of the extraction of heat. Mild massage is very stimulating to the circulation. Care should be taken of the bowels, and warm applications are useful in the stimulation of the abdominal circulation.

Too free feeding should be avoided as it burdens the heart and vessels. Medicaments are best given subcutaneously; the caffein salt or camphor oil are the best, with if necessary, the addition of ether. Digitalis, as a rule, is not well borne. Frequently, however, the end is attained by giving strong coffee or tea, with the addition of brandy or alcoholic drinks. Food must be given often and little at a time, more fluid or pultaceous than solid, more hydracarbons and fats than albumen. The old man lives through the administration of the daily amount of calories, and one day without food brings about a loss of power that may never be made good again.

The mouth and pharynx should be cleansed with borax and glycerine as aphthæ are apt to develop. The food should be given warm and the solid parts minced. Spices and salt should be given freely; alcohol also on account of its stimulating action. Food is best given in the shape of well cooked meats, sugar, milk and cream. The required amount of albumen, sixty to eighty grams, is best given as an addition to the milk in the shape of some nutritive preparation. If necessary, food should be given by the rectum.

EYESIGHT OF VIENNA BOARD SCHOOL CHILDREN.

The result of the systematic investigation of the eyesight of children attending the Vienna Board Schools, carried on since October, 1922, by eight ophthalmic surgeons, goes to show that among the boys six per cent. and among the girls nine per cent., suffer from more or less serious defects of the visual organs. It is noteworthy that the proportion of scholars with visual defects was much more marked in the poorer districts than in districts of a better class, and it is greatly influenced for the worse by the presence of children of foreign parentage. It is estimated that two years will be required to complete the examination of all the children, who number about 60,000. This result amply justifies the necessity for systematic examination of new scholars, since much of the labor bestowed on the defective children is thrown away in consequence of their physical inability to derive the benefit thereof.

VENEREAL DISEASES IN RELATION TO LIFE INSURANCE.

As a recent meeting of the Vienna insurance doctors, Dr. Löw read a paper on this subject. He said that it is generally held that an attack of syphilis radically depreciates the "life value" of the victim, and from a sickness point of view it may fairly be assumed that for some years after an attack, the liability to disabling sickness is tangibly enhanced. The view is equally accepted that an attack of gonorrhea entails no serious consequences once it has been recovered from, and it is not even customary to ask candidates for sickness or life insurance whether or not they have ever suffered therefrom. If, however, any practitioner asks himself which disease in his experience has most manifestly contributed to cause invalidity and premature death he will not improbably be disposed to state that the ultimate results of gonorrhea are at least as disastrous as those of syphilis. For one case of locomotor ataxia or other nervous disease recognized to be dependent on syphilis there are probably many of enlarged prostate, vesical and renal disease directly due to the presence of an urethral stricture or to past inritation of the prostate. Then, too, there is such a thing as gonorrheal rheumatism, which is far more frequent than is suspected, in spite of the maxim that inflammation of a single large joint, apart from trauma, is generally of gonorrheal origin. There is, of course, the fundamental difference, that while in gonorrhea any subsequent mischief is the direct consequence of a lesion ascertainable on examination, that associated with syphilis is more occult, and may give no indication of its existence until the symptoms of the impending disease present themselves. The question is one of considerable interest from the insurance examiners point of view, and it can only be cleared up by careful study.

NEW REGULATIONS FOR FEMALE TRAVELERS IN HUNGARY.

The minister of the Hungarian railways has issued new regulations to the railway guards wherein they are earnestly admonished to segregate strictly women passengers traveling without escort. That this has become increasingly necessary, was emphasized by a sad incident which occurred a few days ago. A girl of sixteen (travelling in the third class), through lack of room in the female department of the car, entered a smoking car. The men therein carried on during the journey such a vulgar and disgusting discourse that the girl, when leaving the car, fell down from nervous prostration as the consequence of the filthy conversation she had been compelled to listen to. This new decree, that girls without escort must not travel in railway cars, except in reserved compartments, has been received with general favor

THE CORRODING EFFECT OF ALCOHOL ON INSTRUMENTS.

Surgeons who use alcohol for the sterilization of instruments will doubtless be interested in some experiments, which have recently been made by Dr. Jacobovici, professor of surgery at the University of Bucharest, with the object of discovering the effect of absolute alcohol on metals. Dr. Jacobovici in his experiments used ninety-five per cent. alcohol which left no residue on evaporation. The metals—copper, iron, tin, lead, zinc and galvanized iron—were corked up with alcohol in glass flasks and kept at ordinary temperatures for six months. The copper was entirely free from corrosion but in all the other flasks there was a deposit on the bottom and the metal was covered with a similar deposit. In the case of tin, lead, zinc and galvanized iron the deposit was white; that from the iron was red, resembling iron rust. All of the liquids, except that in which the lead had been placed, filtered clear; the latter retained a milky appearance after repeated filterings through double filters. The clear filtrates from iron, lead, zinc and galvanized iron gave much residue on evaporation, while the residue from tin was hardly appreciable. In the former group it is clear that not only had the metal been oxidized, but a considerable quantity had entered into the solution. Dr. Jacobovici's experiments have had quite similar results to that of Dr. Malmejac carried out about a quarter of a century ago.

THE MEDICAL EXAMINATION OF SCHOOL CHILDREN.

The Board of Sanitation of the City of Vienna has decided to ask the school medical officers of the city to undertake a general medical examination of Vienna school children every two months, and to record the condition of the mouth and teeth on a special sanitary card, as is done in Paris. When necessary, the children will be sent to dental surgeries selected for the purpose by the authorities.

THE UNIMPORTANCE OF A NEGATIVE WASSERMANN REACTION.

Dr. Konrad, lecturer on venereal diseases in Breslau, Germany, says in an article on the subject of a negative Wassermann that most unfortunate consequences attend the practice of attaching too much importance to a negative reaction.

GENEVA LETTER

(*From our own correspondent*)

GENEVA, *March 20, 1923.*

TREATMENT OF LOCOMOTOR ATAXIA.

(*Concluded from page* 245)

One cubic centimetre of solution should contain one centigram of the drug, this being the dose. The treatment is generally well tolerated. If by chance it produces some intestinal disturbance, such as pain in the transverve colon or diarrhea, paregoric or tincture of opium will suffice to control them, if they are not very great. If they persist, the treatment must be given up and commenced again a few days later.

A series of fifteen injections should be given four times a year and twice yearly should be reinforced by a series of arsenical injections, to which reference will be made. The cyanide injections are unquestionably potent and the reason why this treatment is not more general is because it offers certain technical dangers when the procedure is not carried out with exactitude. When from unskilfulness the mercurial salt is injected outside the vein fearful pain ensues with inflammatory swelling which soon becomes hard and extends over considerable area. The patient's general health is affected, even with quite an elevation of the temperature. In most cases sloughing occurs which takes quite a long time to cure, and when recovery has taken place more or less induration *en masse* results with occlusion of the veins, whose permeability is the patient's salvation.

Besides this serious accident there are minor ones which are equally very serious. If the solution is simply injected alongside the vein in a minute quantity pain ensues, with inflammatory swelling and a nodule which will occlude the vessel. On the other hand, if the injection is pushed into the midst of the walls of the vein a nodosity will occur which obliterates the lumen. If the intravenous injection is not given adroitly, if the needle is thrust several times into the vein, the pain caused will discourage the patient and the changes arising in the walls of the vessel from the numerous punctures will result in small cicatrices so that after a time the vein becomes occluded to such an extent that it becomes useless for the procedure. Therefore, the technic must be acquired under the direction of men versed in it and as this means practical work in a clinic no mention need be made of it here.

But I would say a word as to the treatment of the accidents mentioned above, should they arise in the treatment of locomotor ataxia. First be it said that the injection should be given slowly, because some few patients will be distressed if the injection is introduced suddenly. A kind of dyspnea results, with paleness, due to the arrival *en masse* of cyanide of mercury in the bulbar region. When all the solution has been injected it is well to aspirate a little blood into the syringe and reinject it. This little maneuvre rinses the needle of all trace of the mercury so that none is left to escape into the tissues when the needle is withdrawn, which othrwise might give rise to accidents of mild degree.

If a little of the solution should be injected along the outside of the vein the following measures must be resorted to without delay. Fifty cubic centimetres of sterile water should invariably be ready at hand and to this one centigram of cocaine hydrochlorate is added. A needle is then pushed in under the point at which the mercury solution has entered the tissues and twenty c. c. of the cocaine solution injected. The needle is then withdrawn a little and ten c. c. of the solution injected at the spot where the mercury has escaped in the tissues and finally the needle is still further withdrawn and twenty c. c. more of the cocaine solution is injected at the point under the skin at which the mercury solution was given. By this means an extreme dilution of the mercury solution is obtained so that it no longer has a caustic action, while at the same time a layer of water is injected above and below the point of injection of the mercury solution, which protects the tissue from the action of the latter.

On the other hand, as the solution contains cocaine the pain is abolished. It is well to employ a needle, such as that used for intramuscular injections for making the "three layer" injections, so that it can be pushed in in various directions like the spokes of a wheel in each layer in order to spread the solution. A hot moist dressing is then applied. These dilute cocaine injections should be renewed ten hours later and then once a day for six days. Some induration will occur but it does not slough and by massage the tissues may acquire their former softness.

It is well to recall that when the mercury solution is injected into the lumen of the vein the patient occasionally experiences rather sharp pain lasting a couple of hours, following the course of the vessel up to the clavicle. This pain is endovenous and Chauvet regards it as due to irritation of the sympathetic nerve filaments and not to that of the venous endothelium. As it is observed on certain days and not on others, this observer is inclined to suspect that the composition of the blood varies, at times mixing well with the mercury solution, at others not, thus explaining the pain when this is the case.

Injections of novoarsenobenzol should be given once a week. Remarkable results are obtained in tabetics, as well as in general paresis, but large doses are to be avoided, small ones are better and given over a longer period of time. Begin with ten centigrams and if the first injection is well tolerated repeat this dose at the second. The four following injections are fifteen centigrams each, the next two twenty centigrams each, and if all goes well, the last doses may be thirty centigrams each. Ten injections are given in all. The arsenic injections must always be given at the patient's house and he should always be fasting and in bed. Should nitritoid accidents supervene they are to be dealt with by intramuscular injections of adrenaline hydrochlor.

Such briefly, is the treatment most generally adopted in France and Switzerland for incipient tabes, but when intravenous injections cannot be given because of the small calibre of the veins, or on account of an excessive amount of subcutaneous fat, intramuscular injections may be used. These consist of one centigram of oxycyanide of mercury dissolved in two cubic centigrams of Locke's solution to which one centigram of stovaine has been added.

Radiotherapy for radicular pain is under study and at the present writing I think it is fair to assume that the results are on the whole encouraging.

Book Reviews

GONORRHEA

Die Gonorrhoe des Mannes und ihre Komplikationen. By Geh. San-Rat Prof. Dr. Hans Wossidlo. Third Revised Edition, by Dr. Ehrich Wossidlo. Leipzig: Verlag von Georg Thieme, 1923.

This third edition of the well known work by the late Hans Wossidlo, and which the younger Wossidlo dedicates to the memory of the elder, does not differ materially from its predecessors. Ehrich Wossidlo has revised the work and has added new chapters on vaccine therapy and diathermy, but the work still remains practically the same.

One does not find anything new or startling in this volume; it even appears that some of the smaller and less pretentious volumes on gonorrhea in the male which have come out of Germany recently have been more modern in scope and outlook, particularly in the matter of diagnosis and the employment of diagnostic aids. The new chapters on diathermy and vaccine therapy cover the usual ground and constitute a safe guide for the treatment of gonococcal complications.

CYSTOSCOPY

Handbuch der Cystoskopie. By Dr. Leopold Casper. Fifth Edition, with 170 Illustrations and Twelve Plates in four colors. Leipzig: Georg Thieme, 1923.

The fourth edition of this classic work by Casper which was reviewed in these columns about a year ago, has been so rapidly exhausted that a fifth printing has been found necessary. Casper has taken advantage of this necessity and has revised in some measure certain parts of the work, bringing it up to date. Nine illustrations have been added in the text, but the colored plates both as to character and number remain the same as in the last edition. Special emphasis is attached to pyelography, especially in children, and to radiography of the urinary tract. The student and practitioner of cystoscopy will do well to have this volume and master its teachings.

METHODS OF BACTERIOLOGICAL EXAMINATION

Praktikum der klinischen, chemischen, mikroskopischen und bakteriologischen Untersuchungsmethoden. Von San.-Rat Dr. M. Klopstock und Dr. A. Kowarsky. Berlin und Wien: Urban & Schwarzenberg, 1923.

In this, the seventh edition of this book, the authors have replaced the tests that require expensive or large amounts of costly reagents by those that are simpler and cheaper, but this replacement was always made with an eye toward accuracy and reliability. A greater importance is given to the subject of micromethods. Some of the more recent reactions that have received recognition are also included, such as the gold sol and mastic reaction, the determination of the bilirubin content of the blood, of the rapidity of sedimentation of the erythrocytes, etc. Of the more recent serological tests, the clouding reactions of Dold and Meinicke are described. The various chapters deal with the following subjects: bacteriological examination of the secretions and deposits of the mouth and pharynx, of the nasal and the conjunctival secretions, the sputum, gastric contents, feces, urine, the urethroprostatic secretion, the blood, punctates and the skin. A separate chapter is devoted to the usual bacteriological methods of examination, the staining formulæ used and the nutrient media. This book is of assistance to the general practitioner who wants to brush up on clinical pathology.

ANEMIA.

Les Anémies. By Dr. Leon Tixier. Paris: Ernest Flammarion, 1923.

This book is the fruit of the author's twenty years' experience with diseases of the blood. The nature and the causes of the different types of anemia are discussed. Special attention is devoted to the anemias of infancy. In the section on anemias of adults the causes of secondary anemia are well presented. Throughout the book the author gives evidence of his thorough knowledge of the literature. It is doubly unfortunate, therefore, that he has completely omitted a bibliography. One third of the monograph is devoted to a discussion of the treatment of the anemias. This section might well have been abbreviated. Many therapeutic agents of decidedly questionable value, such as, for instance, the socalled hemopoietic serum, or thorium-x hardly warrant such lengthy discussion in an elementary monograph.

TONSILLECTOMY

Tonsillectomy by Means of the Alveolar Eminence of the Mandible and a Guillotine. With a Review of the Collateral Issues. By Greenfield Sluder, M. D. St. Louis: C. V. Mosby Company, 1923.

While we are seemingly passing the peak of tonsil slaughter and are gradually but surely descending to the level of commonsense and definite surgical indications for removal of the tonsils, there is still a great deal of haziness and uncertainty prevailing in the minds of the operators both as to indications for and the methods of removing tonsils. We therefore welcome the appearance of a book from the pen of a worker whose experience and erudition have greatly helped in establishing tonsillectomy on a more or less secure surgical basis. The subject proper is preceded by a general survey of the embryology, physiology and general pathology of the tonsils, a thorough familiarity with which should be a prerequisite for any method of tonsillectomy. In the description of the operation which occupies half of the volume we notice, among other things, that the author is strongly opposed to the use of morphine before anesthesia, as it is prone to abolish the cough reflex; this is somewhat at variance with the practice of other equally prominent laryngologists. The author's favorite anesthetic, and with good reason, is nitrous oxide gas, whose properties lend themselves particularly to his method of operation. While naturally a staunch advocate of his own method, he is careful to warn those who have acquired satisfactory skill in other methods not to abandon them in favor of a new one.

The perusal of this book will surely put the reader in possession of almost everything worth knowing at the present time regarding the tonsil and its removal, and we heartily recommend it as a valuable addition to every laryngologist's library.

TUBERCULOSIS

A Simple Treatment for Tuberculosis. By Owen F. Paget, M.D. With introduction by J. George Adami, M.D., F.R.S., and Prefatory Remarks by W. P. Birmingham, B. A., M.D. New York: William Wood & Company, 1923.

Dr. Paget's treatment consists of the nasal inhalation of powdered tuberculin B. E. in doses of one six thousandth mgm. to one fortieth mgm. His thesis is that the nasal passages, particularly in the region of the ethmoidal cells, have not alone a local immunity to tuberculosis and to other infections but through their epithelium the power of provoking a general immunity to the invading organism. As a natural corollary to his theory he emphasizes the great importance of nasal breathing and goes so far as to say "The baby who eats soft foods develops weak jaws and inefficient nose, and dies of tuberculosis."

The book, although interesting, is not convincing. One rather agrees with the opinion of a trained expert in tuberculosis under whose supervision Dr. Paget treated a series of cases in the Canadian army. "He was convinced of Dr. Owen Paget's complete sincerity, but could not see the improvement in the cases that was manifest to Paget, and as a skilled diagnostician he regarded Paget's diagnostic methods as rough and ready." It is unfortunate that the book may give the rhinologists another excuse for unwarranted nasal operations.

SURGERY

Mistakes and Accidents of Surgery. By Harold Burrows. New York: William Wood & Co., 1922.

The title of this book is unusual and the reviewer commends the author for his honesty in attacking the problem. It would seem that there would be a decided call for a book of this type with, however, a much more thorough and complete study of the question. The author takes up the various anteoperative errors, then errors that may occur during the operative procedure and finally the postoperative complications. He brings in numerous case reports which add to the interest. One feels, however, that he has not taken up as thoroughly as he might the various diseases that he has discussed. For instance, there is no mention of lung abscess as a sequel to tonsillectomy.

There is no mention in his discussion of gallstones as the anteoperative treatment for lessening the coagulation time in cases of jaundice. In his discussion of diseases of the kidney, cystoscopy for the study of kidney function is not mentioned, nor does he say anything in regard to estimation of urea nitrogen and creatinin in the blood as a means of prognosis in prostatectomy. American urologists have made a thorough study of this subject and by the data derived therefrom can decide whether a two stage operation with primary drainage of the bladder either by a retention catheter or suprapubic cystoscopy is indicated. His article on hernia is excellent. He gives very good and timely advice about empyema—particularly does he show the inadvisability of attempting the most dependent drainage. Too many surgeons have found to their sorrow that after dependent drainage the diaphragm raises and obliterates the costophrenic angle, thereby producing an elongated sinus with insufficient drainage. One feels on reading the chapter on intestinal obstruction that not enough importance is placed on the early operation, speed and gentleness of handling the tissues and the type of anesthesia to be used.

SURGICAL CLINICS

Surgical Clinics of North America. Volume 3, Number 3, San Francisco Number. Published Bimonthly. Philadelphia and London: W. B. Saunders Co., 1923.

Twenty-six surgeons contribute twenty-four clinics to this interesting number of the *Surgical Clinics.* Outstanding features of the number are the clinics by Frank Hinman, on Prostatectomy as a Standardized Operation, Surgical Treatment of Burn Scars, by G. W. Pierce, and a Case of Early Benign Adenoma of the Appendix, by Emge and Cowan. The illustrations are unusually clear and distinctly valuable in conjunction with the text matter. The printing and paper are all that could be desired.

X RAYS

X Rays. By G. W. C. Kaye. Fourth Edition. With Illustrations. London: Longmans, Green & Co., 1923.

This is the fourth edition of a book which is absolutely authoritative. Paraphrasing the heading of a famous New York newspaper: If you see it in Kaye it's so. While giving the basic principles of radiography even to such modern topics as the use of the Bucky diaphragm it does not give directions for radiographing different parts of the body. It gives only a few radiographs, not being intended as a guide to x ray diagnosis. Neither does it discuss the diseases amenable to x ray treatment or its application to each.

A most interesting interview in 1896 between McKenzie Davidson and Röntgen is recorded in which the latter described his discovery of the x ray. He was looking for invisible radiations from a vacuum tube actuated by a high voltage current and had the tube completely covered with black paper. To make sure that no ray of visible light escaped from the tube he darkened the room and saw that a barium platinocyanide screen at a distance of some metres was brightly illuminated by rays which had evidently passed through the black paper. Asked what he thought when he saw this, he answered, "I did not think, I investigated."

During the war the x ray was employed after extensive plastic operations upon the face to prevent induration and contracture of the flaps. Sheet lead is the best means of protection from x ray injuries and only one ten thousandth of the very hard x rays generated by two hundred thousand volts passes through one eighth inch of lead.

Tables are given showing the voltage indicated by parallel spark gaps. Needle points a certain distance apart, permit sparking with a much lower voltage than polished spheres and the latter to be most reliable should have a diameter fully half the spark length to be measured. This prevents the electric leakage or corona discharge. Ionization of the air is produced by the x ray independent of its quality or hardness and affords a reliable measure of its quality. But the currents permitted to flow by air so ionized are only of the order of one billionth of a milliampere so that a milliamperemeter is not commonly used. Instead we watch the rate of discharge of an electroscope charged with static electricity and connected with an ionization chamber exposed to the x ray. X rays passing through air supersaturated with watery vapor produce ions upon which particles of water condense and an instantaneous photograph by a brilliant light shows a maze of these particles in rapid motion. This is one of the most interesting pictures in the book.

The author regards x rays and all other electromagnetic waves such as ordinary light and the Hertzian waves of radiotelegraphy as the "riddle of modern physics." A useful conception is that an x ray is a separate entity like an individual bullet from a battery of machine guns which might be fired almost simultaneously in every direction. Each x ray goes in a narrow path which does not expand and become diffused and weakened by distance. The combined effect is reduced in proportion to the square of the distance because a given number of x rays are distributed over a greater surface. An x ray according to this conception is not like a chain reaching from the source to the point where it may terminate as at a piece of lead but it may be likened to a short length of chain propelled from a cannon and not connected with anything in front or behind itself. This simile is the reviewer's. According to this conception also an end view of a beam of x ray would be a field of luminous points not of uniform illumination. A modern theory of ordinary light is also of this nature.

In making a radiograph, a photographic plate or film records only about one per cent. of the energy of the x ray. The film is much more sensitive to ordinary light and a fluorescent screen in contact with the film converts so much x ray energy into light that the effect upon the film is multiplied. This is the principle of the intensifying screen. The Impex x ray plates have a fluorescent coating which produces the same effect as a separate screen and is washed off before development. The radiographic effect of hard x rays, according to Kaye, may be multiplied thirty times.

Especially sensitive plates, he says, reduce the proportionate effect of secondary rays which arise from the tissues. An interesting application of the x ray is to examine golf balls with reference to the dense solid or liquid core being properly centred, if not, it would fly and roll irregularly. Another is to examine aeroplane parts for defects such as a concealed part split by a screw. Finger prints are very simply made radiographically after rubbing the fingers with red lead. An x ray, whatever its nature may be considered, sets free an electron when the x ray collides with an atom. It is in this way that ionization takes place. But this happens to only a small percentage of the x rays passing through a given medium.

The work gives a most complete, accurate and interesting view of the discovery, production, nature and uses of the x ray.

ELEMENTS OF PSYCHOLOGY

Elements of Human Psychology. By Howard C. Warren. New York: Houghton Mifflin Company, 1922.

The style of this book fits it as a useful reference or textbook for a complete survey of the elements of psychology, the various forms and methods of mental action and their close relation to forms and mechanisms of nervous activity. Only for the most part the author remains upon the surface of things. One can hardly escape in these days some reference to that greater part of mental activity, the dynamic working below the surface. But the references to it are so inadequate as to be actually misleading. For it not only tacitly denies much that goes on there but gives a false conception as to how psychic ends can be attained or difficulties be avoided or corrected. If this is the form of psychology that conceives of anything below the surface as a relatively negligible "subconscious" then let us have a psychology that boldly accepts a profound "unconscious" and all that that might contain.

SANITY IN SEX

Sanity in Sex. By William J. Fielding. New York: Dodd, Mead & Co., 1922.

There is much good material in Fielding's book but so eclectic an attitude is maintained that incompatibles are frequently mixed into a self vitiative dose making its value questionable.

Practically the identical material has been handled in the same way by Pierce. All that one can do in criticizing this book would be to repeat what has been said about Pierce's book. There is little choice between them. More fundamental books have been written on these subjects.

HOW TO WRITE A DETECTIVE STORY

The Vengeance of the Ivory Skull. By Marion Harvey. New York: Edward J. Clode, 1923.

At least five deaths to satisfy the primitive urge of number symbolism. A chain of mystery stretching over three continents and an ancient legend to fall back upon as the final hill in the unravelling. This gives you the ingredients of a most absorbing detective story, free moreover of much of the romantic slush that hampers many a good tale. For no dashing young discoverer marries the misjudged heroine. Instead it is truly a tale of sombre vengeance relentlessly pursued. The touchy, elderly archeologist who is unwillingly drawn into the coils of circumstance furnishes the comic relief and a suitable scientific coloring.

The Sinister Mark. By Lee Thayer. New York: Doubleday Page & Co., 1923.

Light literature for sultry weather! What could be more thoughtful than this latest offering of Doubleday Page & Co. It is the kind of story one reads at a sitting prolonging the evening far into the night if need be. It is not thrilling; its dénouement is not blindingly unexpected. It is just a good old fashioned story of the thorny path true love must tread to scale the glass mountain of the fairy tale. And in this case the glass mountain consists of about every known force of modern obstacle with particular emphasis on the medical side.

AXIOMS AND APHORISMS

Medical Axioms, Aphorisms and Clinical Memoranda. By James Alexander Lindsay, M.A., M.D., F.R.C.P. London: H. K. Lewis & Co., 1923.

The preface of this little book states that "many of the following medical axioms, aphorisms and clinical memoranda have been familiar to several generations of the Belfast Medical School. They are now published in response to many requests, in the hope that they may prove of usefulness to a wider circle." There is certainly much good material in the book, but, since authorities are quoted by no means frequently except in the section devoted to philosophical epigrams, one wonders just why the book is of any great value, except as something of a curiosity in that it is a collection of quotations that may have sometimes a very slight connection with medicine. One gathers that British medical men must have more time for "browsing" than doctors in this country.

Medicoliterary Notes.

Some enterprising psychoanalyst should analyze Algernon Blackwood's *Jimbo: A Fantasy*. The fact that the book is by no means a recent one would make such a study all the more interesting, since it was written long before the layman had any general knowledge of the science of mental analysis. It would be as valuable a contribution to child psychology as Freud's *Study of Gradiva* is to the psychology of adolescence.

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The American Child Health Association has recently issued its fourth annual tabulation of infant mortality statistics from cities of over ten thousand population. The report covers 635 cities, or 97.8 per cent. of the total population.

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A recent book on sex, which is certainly of controversial interest at least, is *The Dominant Sex*, by Mathilde and Mathias Vaerting, a translation of which from the original German has been published by Doran. The authors' point of view is that personal characteristics, instead of being socalled masculine and feminine, are really only the results of domination or subordination of one sex by the other. Illustrations are given from the ethnological histories of countries where sexual supremacy has differed from that of the present time in which men dominate women. The book concludes with a plea for sex equality.

* * *

Probably few people know that the United Fruit Company, whose general offices are in Boston, maintains in many portions of tropical America an elaborate medical department for the care, treatment and education in health matters of its employees. This includes nine hospitals, exclusive of dispensaries, and a personnel of nearly six hundred, including physicians, registered nurses and other trained attendants.

* * *

A medical book which is entertaining as well as instructive is *Cures* by Dr. James J. Walsh, recently published by Appleton. It is a record and history of the many panaceas in which mankind has believed, suffered from and been benefited by, from the earliest times to the day of Coué and the psychoanalyst.

* * *

A million dollar hospital for stage folk will be constructed in New York in the near future, according to plans being completed by the recently organized New York Theatrical Hospital Association, of whose executive committee Dr. McCall Anderson is chairman. The building will probably be eight stories high and have a capacity of one hundred beds. Final plans, it is reported, will be announced early in the autumn.

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The *World's Work* for August contains an article by Ernest H. Baynes entitled Vivisection and Animal Welfare, in which the annual saving from suffering and death of millions of animals through humane and scientific animal research and experimentation is explained and described. Floyd W. Parsons has in the same number an article on Ventilation for Health and Comfort.

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Among other interesting articles in the *Journal of Industrial Hygiene* for June are Atmospheric Particulate Matter: Dust, with a New Apparatus for Its Determination, by Philip Drinker and others; and Prevention of Industrial Lead Poisoning in English Factories, by A. C. Burnham.

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Social Control of the Feebleminded is the title of an excellent new book by Stanley P. Davies, executive secretary of the Committee on Mental Hygiene of the State Charities Aid Association. It is a study of social programs and attitudes in relation to the problems of mental deficiency. Four chief stages of development are reviewed: The ancient and medieval period to the nineteenth century; the period of physiological education, beginning with the first attempt at the scientific treatment of mental defectives and ending with the establishment of the earliest institutions in this country; the "alarmist" period, roughly from 1900 to 1915, when the numerous intensive studies of the subject of feeblemindedness made it a social problem of the first magnitude; and the modern period characterized chiefly by emphasis of extrainstitutional care.

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A study of five thousand vacation camps in this country is being made by the Playground and Recreation Association of America, financed by the Laura Spelman Rockefeller Memorial. The work will include the preparation and publication of a practical summer camp handbook.

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The total number of deaf mutes reported in the United States was 44,885 in 1920, or 425 for each million of general population.

Practical Therapeutics

TREATMENT OF SYPHILIS WITH MASSIVE DOSES OF MERCURY INTRAVENOUSLY

By R. A. Ireland, M. D.,
Charleston, W. Va.

Every physician who treats syphilis desires a much more satisfactory method for exhibiting mercury. Like many other syphilologists I have used the entire gamut of mercury compounds and forms, but the well known advantages and disadvantages inherent in all of them leaves much to be desired in the administration of mercury. Mercury in forms thus far intravenously injected is recognized as being conducive to the quickest results (1) although the dose of mercury thus far given is so small that it is too rapidly eliminated to have a sufficiently profound therapeutic effect and also damage to the vein is by no means infrequent (2).

The intravenous injection of the soluble salts of mercury has always had the drawback of exhibiting too little mercury to receive the full benefit from an intravenous injection. It has always been my conviction that if mercury could be administered intravenously in large enough amounts the treatment of syphilis would be conspicuously advanced. I have been able to substantiate this view and I am detailing below the results obtained through the use of a new mercurial preparation that safely permits of the two essential factors just mentioned, viz., intravenous application and heavy doses.

The medication is called lueside, and is a gray powder composed of chemically pure glucose in which, by some process, metallic mercury has been comminuted. When this powder is dissolved in the proper amount of distilled water (fifty c. c.) a dark gray solution is formed. The color is due to innumerable minute globules of metallic mercury that are suspended in the water. Fear of embolism, however, proved unfounded because mercury being a liquid, the fine globules of this material in the medication seem to pass as freely through the capillaries as water. In administering this metallic mercury intravenously the highly desirable feature of heavy mercury doses with safety is accomplished.

The total amount of the mercury contained in a dose of this preparation is one half gram. I administer two fifths to four fifths of the full dose, or two hundred to four hundred milligrams of mercury every dose, which contrasts strikingly with four or five milligrams of mercury in one twelfth of a grain of bichloride of mercury that is frequently administered intravenously.

Rarely does any symptom of mercurialism appear. Such symptoms usually are only a diarrhea, no kidney damage ever occurring. On the other hand a sustained therapeutic effect is obtained from the large dose of mercury that produces results of a striking nature and confirms the view above stated that the intravenous application of large quantities of mercury is ideal in the treatment of syphilis. Metallic mercury as described here permits of a freedom from toxicity that allows the desired heavy dose without any unpleasant general reactions. In respect to local reactions at the point of the injection no phlebitis or thrombosis of the vein has ever occurred, the metallic mercury being noncorrosive.

In respect to the time for the administration of these massive doses of mercury, I have used it principally in secondary and tertiary syphilis. The massive doses of mercury seem to saturate the lymphatic stream and tissues with mercury.

The following is a series of syphilitic cases which received treatment consisting of heavy doses of mercury intravenously administered.

Case I.—R. S., a while girl, seventeen years old, had just finished taking ten doses of neoarsphenamine and nine doses of arsphenamine and her Wassermann was still four plus. When she was brought to my clinic I determined to try a radical departure from the orthodox line of treatment, and gave her intravenously every seven days 300 milligrams of mercury in the form of lueside. I continued this for eleven doses and now four months after the last dose her blood is reported negative and she seems to be well.

Case II.—C. T., a white girl, twenty years old, had received sixteen doses that she thinks were about equally divided between neoarsphenamine and arsphenamine, and some mercury. Two months later mucous patches developed and she had headaches. Her Wassermann was four plus. I gave her six doses of 300 milligrams of mercury intravenously and interspersed these with three doses of arsphenamine. Now, three months after finishing treatment, she is well and has a negative Wassermann.

Case III.—L. F. P., a male negro, aged twenty-two, had had thirty-eight doses of arsphenamine and neoarsphenamine and small amounts of mercury over a period of three years. He had improved each period when given continuous treatment for a few weeks, only to relapse after treatment had been suspended for a month or two. His Wassermann was four plus, he had syphilitic ulcers on each leg and at the rectum. He was given three six tenths gram doses of arsphenamine and this followed by ten 350 milligram doses of mercury seven days apart. Now, six months after finishing the mercury treatment, his ulcers are healed, he is able to work, and his Wassermann is negative.

I have used lueside on fifty different patients and have given one hundred and thirty doses without bad effect.[1]

CONCLUSION.

The intravenous application of comminuted metallic mercury affords a marked advance in the treatment of syphilis. Such mercury does not produce any disagreeable reaction of either a general or local nature.

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1. Thom: *Syphilis*, p. 209.
2. Thompson: *Syphilis, Diagnosis and Treatment.*
3. Pusey: *The Principles and Practice of Dermatology*, third edition, p. 653 et seq.
4. *Journ. A. M. A.*, April 21, 1923, p. 1167.

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[1] An additional series of cases in which this preparation was used at the Penitentiary Hospital and Dermatological Station at Welfare Island, New York City, will be published in the author's reprints.

THE SALTS OF BISMUTH IN SYPHILIS

By B. Sherwood-Dunn, M. D.,
Nice, France.

Since the discovery by Ehrlich of the remarkable efficacy of arsenic in the treatment of syphilis, this remedy has come into universal employment and salvarsan is probably the preparation most generally used. The numerous accidents, some fatal, that have attended this particular preparation, have given rise to many modifications of it, some of which have survived and found a permanent place in our therapeutics.

At infrequent intervals, however, cases occur that prove refractory to arsenic and a question that is interesting many investigators is what remedy can be successfully substituted in their treatment, and among those mentioned bismuth seems to be one of the most favored.

The researches of Robert and Sainton have brought to light the parasitical properties of the salts of bismuth in relation to the protozoa. The study of these salts, in relation to syphilis, made by Balzar in 1889, has been confirmed by the experimental work of Sazerac and Levaditi and clinically by the work of Fournier and Guynot. In accord with a number of other experimenters these authors declare that bismuth should be considered as one of the energetic agents in the treatment of syphilis. Various salts of bismuth, some soluble and others insoluble, have been utilized.

Sazerac and Levaditi in their communication to the Academy of Sciences of Paris concluded by saying that not sufficient time has elapsed to pronounce upon the permanency of the favorable results secured, but that they feel fully authorized to recommend bismuth as a dependable remedy in the treatment of syphilis.

The injection of these salts caused the rapid disappearance of the treponema and the open lesions. The rapidity of this action has been confirmed by Jeanselme, Chevalier and others. Jeanselme by the disappearance of the treponema sixty hours after the first injection and the favorable action of this agent has been confirmed at all stages of the disease.

Smilyanitch reports a case in the Spillman Clinic, in Nancy, in which the patient suffered a severe stomatitis following injections of grey oil, accompanied by a general exfoliant erythroderma following the third injection of novarsenobenzol. With this evidence of intolerance for both arsenic and mercury the patient was treated by injections of bismuth. The Bordet-Wassermann reaction was positive and became negative after ten injections of tartrobismuth of sodium and potassium, receiving in all a total of two grams. This treatment was well supported with no disagreeable manifestations whatsoever.

Smilyanitch relates the history of another patient with secondary syphilis who presented the same phenomena following three injections of mercury; the patient showed all the signs of serious intoxication, including an intense general exfoliant erythroderma. The treatment was changed at once to injections of bismuth. Ten injections of tartrobismuth of sodium and potassium 0.20 gr. of salt were injected, making a total dose of two grams. The Bordet-Wassermann reaction showed a feeble positive reaction at the beginning of the treatment and was found negative at the close. Nicolas reports a case in which there was a relapse in a short period after each treatment with novarsenobenzol, but permanent good results were secured with the salts of bismuth. He also states that he caused the rapid disappearance of accidents by the use of bismuth in a patient who was intolerant of arsenic and in whom mercury seemed to have no effect.

Guilbert reports a case in which the patient was intolerant of arsenic and mercury administered upon the appearance of the primary chancre. The presence of the treponema was verified by the microscope. The patient was treated by simultaneous intravenous injections of arsenobenzol and intramuscular injections of grey oil. He received a total of 6.25 gr. of arsenobenzol. During the entire duration of the treatment, instead of an amelioration, there was a progressive aggravation and extension of the primary chancre. In consequence, he was submitted to treatment by hot air, hot baths, etc., without success. Finally without any great enthusiasm he administered injections of tartrobismuth of sodium and potassium. After six injections there appeared a decided amelioration and cicatrization was complete after the eighth injection.

Fixier has reported an extremely interesting case of hereditary syphilis in a child of twelve years, who during a period of four years showed not the slightest favorable results from the administration of arsenic, mercury and iodide, but who responded immediately and in a most favorable manner to the administration of bismuth.

Azotolay has published a case of precocious malignant syphilis in which thirty-six injections of 0.02 gr. of benzoate of mercury were administered without the slightest benefit and, on the contrary, presented ulcers three months after the commencement of the treatment. A decided abatement of all the symptoms with complete cicatrization of the ulcers was secured at the end of twenty-eight days after twelve injections of the iodide of bismuth and quinine.

Leri, French and Wissmann-Netter have published an extremely interesting case of a patient, twenty-eight years of age, who fifteen days after the appearance of the chancre presented a general pustulous eruption profoundly ulcerous and with crusts, who in addition to high fever was in a state of general anemia (2,300,000 red corpuscles) and as is general in precocious malignant syphilis, no involvement of the mucosa, and no general adenopathy. The Bordet-Wassermann reaction was already positive. With difficulty a few rare treponemas were found in the ulcers. After six injections of 0.20 gr. of quinobismuth, two a week, well supported, the ulcers became cicatrized, the fever disappeared, and the red blood corpuscles were increased to normal, although the polynuclear leucocytosis persisted.

A peculiar accident appeared in this case, for as the ulcers cicatrized a lesion appeared upon the tongue, which gave rise to the thought that it might be due to intoxication from the bismuth, but as the results in every other respect were so favorable the treatment was continued and this lesion disappeared, showing that it could not be imputed to the bismuth.

The nitritoid crisis never follows the administration of bismuth.

There are two principal forms of bismuth in use, the tartrobismuth of sodium and potassium (soluble), prepared in an aqueous solution and also suspended in oil. The sterile aqueous solution is stabilized and neutralized and put up in ampoules representing one c. c., which contains 0.10 gr. of the bismuth salt, corresponding to 0.032 or 0.035 gr. of the metal. The solution is rendered sterile without the addition of any form of antiseptic or anesthetic. In general it is well retained, the injections are made fairly deep in the classical region of the gluteus muscle. A cure requires the injection of from fifteen to twenty ampoules, one ampoule every two days or two ampoules may be injected at a time, at intervals of four days. At the close of the series of fifteen or twenty ampoules, the patient is given a rest for a month, when the treatment can be repeated, if the Bordet-Wassermann reaction indicates that it is necessary.

The tartrobismuth of sodium and potassium, although perfectly soluble in water, is not soluble when suspended in oil, except as it comes into contact with the fluids of the organism, which render the combination soluble, but it is absorbed much more slowly than when suspended in water, and there are advanced cases where this retarded solubility is desirable.

The second form of the remedy is insoluble and consists of the double iodide of quinine and bismuth, containing 19.02 or 19.05 gr. of metallic bismuth for every 100 grams. It is prepared in ampoules containing three c. c. and sterilized by heat; each c. c. represents ten centigrams of the product, or 0.0192 or 0.0195 gr. of the metal.

The intramuscular injections are made the same as for the aqueous solution. As the consistence of the suspension is fairly heavy, rendering its flow somewhat slow, it is necessary to employ a rather heavy needle of from eight to ten millimetres, and it is well to employ one needle for aspiration and a second needle for the injection. The treatment consists of twelve ampoules, one used at a time, at intervals of three or four days, which can be repeated, if the Bordet-Wassermann reaction is not completely negative after a rest of from four to six weeks.

A recent published work by Professor Ehlers, of Copenhagen, gives many interesting details of favorable results with this remedy (1).

The inconvenience attached to this remedy is the local discomfort of the injection, which is rarely of any great consequence if the injections are correctly given, and the patient must be watched for evidence of intolerance, usually shown in a more or less marked degree of stomatitis, which is readily controlled if proper precautions are taken at its inception.

I do not think that any investigators believe that bismuth is destined to be a substitute for arsenic in the treatment of syphilis, but they do assert that it plays an important rôle in cases that are resistant to arsenic and mercury.

To those of my readers who care to investigate the various claims put forward for bismuth in the treatment of syphilis, I have prepared a bibliography which covers the subject in all of its aspects. This bibliography will appear in my reprints.

REFERENCES.

1. Ehlers: *Bruxelles medical,* 22 Mars, 1923.

54 Boulevard Victor Hugo.

UNTOWARD RESULTS OF INTRAVENOUS INJECTION OF SODIUM IODIDE

By L. Isacson, M. D.,
Sioux City, Ia.

At present, the method of applying medication by the intravenous route is greatly in vogue in the profession; rheumatic conditions, complications of gonorrhea, and all kinds of chronic ailments have been subjected to intravenous injections of foreign proteins, vaccines, and all the chemical agents of our pharmacopœia. The commercial firms putting up these preparations are constantly advertising the splendid results of some workers, while unfavorable or untoward effects are never mentioned.

I wish to report a case of gonorrheal epididymitis, which has been under my care for the past six weeks. Impressed especially by the article of A. Ravich in the New York Medical Journal of May 3, 1923, I employed the sodium iodide treatment.

Case.—C. G. came for treatment on March 1, 1922, with a chronic anteroposterior urethritis, prostatitis, and right epididymitis. The swelling of the epididymis had been present for ten days; there was extreme pain, the temperature being 100° F. Fifteen grains of sodium iodide were injected intravenously, a comparatively small dose, the average amount recommended by Ravich and others being thirty grains. The following morning I was called to the patient, who was confined to his bed, presenting a striking appearance: the upper left eyelid was markedly swollen, together with enlargement of the salivary glands; the patient experienced a great deal of difficulty in opening his mouth, owing to extreme pain. On both hands and forearms there was an extensive erythematous, papular dermatitis, with subjective symptoms of itching and burning; later, some serous exudation developed on the left forearm. The patient complained of violent headache, nausea, chills, vomiting; he was confined to his bed for three days, until all symptoms subsided.

The preparation used was made by a well known drug firm, was taken directly from the container and injected with all aseptic precautions with the Luer syringe.

I believe that all of the symptoms in this case were the result of the mode of administration, and were not due to any idiosyncrasy on the part of the patient, as prior to injection tincture of iodine was applied to his skin and no reaction observed. Subsequently, we gave the patient two grams of sodium iodide by mouth, with no untoward effects. While this is an isolated case, and no definite conclusions can be arrived at, I feel that this experience is enough to warrant my making the statement that a halt should be called upon promiscuous intravenous therapy.

Cysts of the Epididymis.—R. Ogier Ward (*Lancet,* October 14, 1922) reports that cystic degeneration of the epididymis is a common condition. Its pathology is uncertain. It is a disease of maturity and often affects both sides. If tapping fails to give relief for more than inconveniently short periods, excision of the cyst, or perhaps of the whole epididymis, is necessary, taking care that the vascular supply of the testis is not compromised.

Proceedings of Societies

NEW YORK ACADEMY OF MEDICINE.

SECTION ON GENITOURINARY SURGERY.

Meeting Held on May 17, 1922

DR. ABRAHAM HYMAN in the Chair.

Presentation of Patients, Case Reports, Specimens, New Instruments.—Dr. VICTOR C. PEDERSEN opened the scientific session with two case reports, the first, an unusual one of stone in the bladder of a boy. The outstanding feature of this case was that the bladder wall was found to be at least three eighths of an inch thick. A suprapubic cystotomy was done, and there were indications that the patient's convalescence might be long and troublesome, including a pericystitis followed by a longstanding sinus. But neither of these conditions appeared, and the wound healed with comparative rapidity. During his stay in hospital, the bladder capacity of the patient changed from about one and a half to eleven ounces. There was a relapse of cystitis, but a röntgenograph taken two weeks later showed all parts negative. Dr. Pedersen's personal opinion was the boy would have more stones rapidly, and that another cytoscopy would have to be made under anesthesia. The only analogous case in Dr. Pedersen's knowledge was that of a Chinese morphine addict, from whose bladder a stone the size of an orange was removed.

The second case presented by Dr. Pedersen, with specimen, was that of the removal of the portion of vas and ampulla during prostatectomy. Dr. Pedersen stated that it was the only accident of the kind he had ever had, and that he was presenting it because of its curious results. In performing a suprapubic operation, it was found that the middle lobe was adherent and definitely hard upon dissection. In trying to get out two small nodules which seemed to be holding it, a piece of the vas deferens five or six inches long and the ampulla were removed. Severe complications were expected from this, but seemingly the wound was fairly superficial and not lacerated. Examination of the floor of the bladder at the time of the operation failed to show the opening through which the vas and ampulla had been taken from the usually ragged cavity seen in all prostatectomies. There were no complications, and convalescence went well, except for the return of the cancer signs.

Dr. HOWARD S. JECK next presented a case of tabetic kidneys diagnosed as tuberculous, with autopsy findings.

Dr. W. F. MCKENNA then gave a full history of a case of recurrent renal calculi, with lantern slide demonstrations. The interesting feature of this case was the rapidity of the return of a stone in the right kidney, only about four months having elapsed between the patient's discharge from hospital after a pyelotomy and removal of a stone, and his return, with x ray shadows showing again on the right side.

A discussion by Dr. B. H. CAPLES followed of some new instruments, namely, tunnelled sounds, and a modification of the Maisonneuve urethrotome. In the instruments presented by Dr. Caples were embodied, he stated, the best points of others in use by the profession, and of some which had apparently disappeared from the view of the modern urologist, such as the dilator and catheter devised and used by Sir Henry Thompson in 1852, and later modified by Fessenden Otis. He had added, he said, the accepted sound handle, the groove to facilitate external urethrotomy, had changed the material from silver to steel, and had made it uniform in calibre throughout their entire length. The modification of the Maisonneuve urethrotome was presented because the principle involved was identical, namely, the threading of the staff for its entire length over a whalebone filiform. Dr. Caples closed his subject with a plea for conservatism, patience, and skill in all instrumentation, and that skill be armed with gentleness rather than with fortitude.

Dr. O. S. LOWSLEY spoke of the regional prevalence of urinary calculi, of the possible causes, such as diet, drinking water, infections, urinary obstructions, etc., and of the slight knowledge of postoperative treatment with a view to prevention of recurrence. It was a problem important enough to warrant the most careful research. Dr. MCKENNA said that he considered kidney stones analogous to gallstones, and as the products of infection rather than of diet.

Observations on Intrarenal Pressure in Dogs was the title of the closing paper of the meeting read by invitation by Dr. B. A. THOMAS, of Philadelphia. Dr. J. E. SWEET was a joint author of the paper. They expressed the opinion that, in view of the fatalities and many nonfatal injuries and damage occasioned by pyelography in recent years, this was today one of great importance to the conscientious urologist. A review of the literature of the subject had showed that there seemed to be no uniformity of opinion as to how and why, in the majority of cases, these fatalities and injurious results were produced. Some declared that the various silver compounds employed had caused a complete blocking of the blood vessels; others that a hydronephrotic sac had been ruptured, causing peritonitis; others had attributed death to a reflex inhibition of the heart; others cited anuria, and still others believed that death had been caused by secondary retention of the substances used, due to ureteral obstruction. The one generally accepted opinion and indication seemed to be that as little pressure as possible should be used in making the injection into the kidney. There was, however, no statement as to how excessive pressure acted. Indeed substances absorbed by the kidney seemed to need little or no pressure. Hence arose the question What is the path followed—the secretory system of the kidney, the tubules and glomeruli, or the lymphatics?

The problem of toxicity had been thoroughly studied, with the result that concentrated solutions of the halogen group were being used instead of the more toxic silver colloids. There would seem to be a field for the study of the comparative effect upon the kidney itself of a concentrated crystalloid solution. The authors did not find any discussion of the possible effect of the x ray exposure upon the kidney substance, perhaps rendering it more susceptible to substances to which normally it would not react. Again the question of anuria following pyelography done only on one side might be explained on the basis of a crossed reflex inhibition of function in so far as the healthy or injected kidney was concerned. Definite clinical evidence was quoted in studying the functional sufficiency of renal tuberculosis, with indigocarmen, to substantiate this view.

The writers stated that their early experiments on dogs, directed toward determination of whether or not pressure on the kidney pelvis could produce inhibitory reflexes upon the heart, showed that pressure alone produced not the slightest effect upon the respiration or blood pressure of the etherized dog, so long as a nontoxic solution, such as a normal salt solution, was used. Even a pressure of 400 mm. of mercury could be maintained when the salt solution ran into the venous system of the kidney without the slightest deleterious effect. In investigating this point, the authors found that in pressures of between 150 and 200 mm. of mercury the pelvis of the kidney ruptured, the tear extending directly across the venous system; while further injection into the kidney became nothing more nor less than a direct intravenous infusion. Substituting a toxic solution, such as concentrated sodium citrate, in place of normal saline, the animal died a rapid heart death immediately after the point of pressure was reached at which rupture occurred. The question, therefore, resolved itself, in the belief of the authors, into, What constitutes a harmful pressure? They had come to the conclusion, in conformity with clinical observations, that this point was much lower in the case of diseased kidneys than in normal ones. Indeed, clinically, the disease might be of such a character or extent as to render pyelography prohibitive. The writers stated that they were still working on the problem of how to throw light on the point as to how substances reached the tubules or glomeruli, as a result of absorption from the kidney pelvis, and were of the opinion that the paths differed, perhaps, with the substances or solutions employed.

Dr. Lowsley, in discussing the paper, complimented the authors on their having been able to prove that strong pressure could cause rupture of the kidney pelvis and direct intravenous infusion of the material used. The two important things in pyelography were the choice of the patient and of a nontoxic material. It had been found that sodium iodide was the least toxic. Dr. Lowsley said that, in his opinion, pyelography was not done often enough, but he emphasized the fact that cases must be very carefully selected. It could not be done on the infirm or aged, nor upon those recovering from fever or acute infections. He outlined experiments he had been making upon rabbits in studying kidney conditions.

Dr. Pedersen asked Dr. Thomas if he had investigated the question of nephritis in the dogs he had experimented upon. He said that a friend of his had spent nearly a year experimenting upon dogs with reference to causes of ordinary medical nephritis, when the thought struck him that he had better examine their kidneys. He found that about fifty per cent. of street dogs have this disease. Hence all his work had been useless.

Dr. N. P. Rathbun, Dr. Clarence G. Bandler, and Dr. Abraham Hyman commented most favorably upon Dr. Thomas's interesting paper, and asked a number of questions, which Dr. Thomas answered in his remarks which closed the discussion. He agreed with Dr. Lowsley, that bilateral pyelography was the better. Investigators had found, he said, that the iodides were more irritant than the bromides, therefore sodium bromide had been preferred. It was possible that the iodide might be less toxic than the bromide, but this was not certain. On the one hand was irritation; on the other there might be a toxic effect. Which was preferable, therefore, was difficult to say. It seemed to him and Dr. Sweet that death or damage occurred in one of two ways. There might be a sudden or a slow death. In the event of sudden death, the kidney ruptured and immediate invasion of the bloodvessels by a toxic substance might take place, causing death in a few hours. Cases of slow death might be explained as follows. There might be invasion of the tubules or glomeruli as the result of irritation, which, though it did not cause death, might be the source of sufficient injury to shorten the patient's life, and result in earlier death from low grade chronic nephritic causes than could otherwise have been the case. He had not examined the dogs for nephritis, having been concerned more with the question of pressure and ruptured pelvis than with any other. It was of interest to note that the preponderance of deaths had occurred with collargol and other silver preparations.

Meeting held on October 18, 1922

Dr. Abraham Hyman in the Chair.

Leukoplakia of Bladder.—This report was made by Dr. Julius J. Valentine. He said that the discovery in this case of leukoplakia was incidental; the patient had not presented himself for any urinary disturbance, but for syphilis, and it was the recurrence of the gonorrhea and the persistence of the turbid urine that led to a cystoscopic examination, at which time the lesion was found. As to whether or not the lesion itself was producing the symptoms, he had been in doubt, but the man had no symptoms except chronic retention of urine, and it seemed that by relief of this and the establishment of better drainage, improvement might result, and the pyelonephritic kidneys be given a chance to function better. His readings led him to agree with others that leukoplakia of the urinary tract usually occurred in cases of chronic infection of that tract, and of those who have had an obstruction to the normal outlet of urine; that syphilis might be an etiological factor; that syphilis might have existed in an individual prior to his having acquired syphilis or gonorrhea, and as a result of these infections, the lesion might be brought into activity.

Complete Ablation of External Genitalia.—Dr. Terry M. Townsend, who described this case, said that it was impossible to present the patient, since he was an inmate of Sing Sing Prison, but he wished to submit the specimen and the report because of unusually interesting features connected with them. The patient, twenty-four years of age and colored, had had for a long time a condition of the prepuce that would not heal. He had had radium treatment, and repeated doses of salvarsan, all without effect, and his condition grew steadily worse, until, when admitted to the prison, an extensive ulceration of the prepuce was found. A complete extirpation seemed the only chance of saving his life. The operation was performed, and the specimen, removed *en masse*, contained the upper segmental triangle, the lymph nodes of the pubic region, the fat, the mons veneris, penis, scrotum, and testes. Then incision was made into Scarpa's triangle, where were found two or three lymph nodes which drained into the superficial inguinal nodes, so it was necessary to clear the region of the saphenous vein. This was done, carrying the incision downward, and a plastic operation was performed. This was the most troublesome part of the work, as at first it did not hold, but good results were finally secured, and the man was soon able to be up and about. The plastic part of the tension would still have to be watched.

Some Unique Blood Chemistry Findings.—Dr. Joseph F. McCarthy and Dr. Killian presented this paper, which related to a patient who had had a pyelogram done on him, the medium employed having been bismuth and ammonium citrate, twenty-five per cent. solution, four days following which there supervened almost complete anuria, which lasted for several days. The blood chemistry findings during the critical period revealed 23.1 mgm. of creatinin to 100 c.c., and 104 mgm. urea nitrogen. The usual measures having been exhausted and proved fruitless, the employment of the duodenal tube was considered and inaugurated with the most striking benefit, there having been a pronounced amelioration of vomiting, an enormously increased output of urine, but little effect upon the urea nitrogen and creatinin until grand lavage with tap water and soda bicarbonate was instituted by means of this tube. Within five or six days following the beginning of the lavage, the blood picture demonstrated a spectacular improvement. This continued until normal findings were encountered. During this period a small calculus was passed, which undoubtedly was the causative factor. The writers advocated the use of the duodenal tube in cases such as those of drug poisoning, postoperative prostate, etc., wherein there occurred a rapid accumulation of nitrogenous contents in the blood, but where the renal parenchyma was not destroyed by chronic pathological change.

Metastatic Abscesses of Both Kidneys.—Dr. Edwin Beer presented a patient illustrating a group rarely observed. On May 16th an operation had been performed under the diagnosis of left perinephritic abscess, probably due to cortical abscess of the left kidney. Eight days afterward, the temperature suddenly rose to 105°; this was relieved, but went up again on the 26th, with pain in the opposite kidney. Three days a similar operation was done on the right kidney. After this, the patient made an uninterrupted recovery.

Recent Impressions of Urology in Europe.—The chief paper of the evening was read by Dr. Oswald Swinney Lowsley. He said that he saw three outstanding urological departments. The first described was the service of Primatorius Kroiss in Kaiserjübilaens Hospital in Vienna. It contained the best kidney operating table he had ever seen, and two cystoscopic rooms equipped with an interesting but very simple device for holding the cystoscope in position. It consisted of a fixed pulley just over the table, and a moveable one with weight attached which was just sufficient to hold the instrument. A light cord was strung through these pulleys. Another excellent service was that of Prof. Edmond Papin, in St. Joseph's Hospital in Paris. When he was there Papin was greatly interested in the relief of painful hydronephrosis by an operation consisting of severing the entire nerve supply of the kidney, and fixing that organ to the twelfth rib. His results had been most successful. In London, Mr. E. C. Ryall, and his assistant, Mr. Attwater, had established All Saints Hospital for genitourinary diseases. They said they had made great advances in the treatment of inoperable tuberculosis of the urinary tract by giving gradually increasing doses of old tuberculin until the patient might be receiving as much as two c. c. every three days. Dr. Lowsley said that he found the clinics and institutions as a whole in bad condition from the economic state of the countries; France seemed the most prosperous. The condition of the general practitioner, also, was everywhere bad; people cannot afford to employ them. University students in Germany and Austria attended lectures or classes until about 2 p. m., then went about earning their daily bread. Among things of particular interest reported by Dr. Lowsley were:

In St. Joseph's Clinic in Berlin a substance was used called Ri Venol which gave good results in relieving extreme cases of bladder irritation due to tuberculosis; in both Paris and Berlin, enthusiasm was displayed for the heat coagulation destruction of tumors of the bladder; it was pleasing to note that in every country visited the cystourethroscope of Dr. Joseph F. McCarthy was in general use; no one but Rosenstein seemed enthusiastic about the perinephritic insufflation of gas in kidney conditions; and no one but Steinach about the rejuvenation experiments; there was considerable secrecy about the discovery of a new cure for sleeping sickness developed at the hygienic institute for tropical diseases at Hamburg by Dr. Bayer, and called Bayer 205; the originator asserted that it was a trypanocide, and might be used in any disease caused by spiral organisms. On the whole, it seemed that Americans were doing much more for the advancement of medical science than their European confrères could do for some years to come. The Rockefeller Foundation was doing an excellent thing for Europe by erecting a hygienic barrier between Western Europe and Russia, whence most of the epidemics originate at present. Every courtesy was extended to foreigners, especially in Austria and Germany, where was evident a greater friendly professional interest in medical visitors than in France or England. Dr. Lowsley closed his paper by emphasizing the necessity of America's doing something to relieve the condition of the general practitioner in Europe, who is practically destitute, particularly so in Austria.

Discussion.—Speaking of Dr. Valentine's case, Dr. Beer said that he had seen the patient when cystoscoped, and questioned whether the lesion had had anything to do with the symptoms. He stated that in his experience a leukoplakia of the urinary tract did not occur in the course of syphilis, but was apparently of congenital origin. He suggested that, if Dr. Valentine should decide to operate, he destroy the area of the leukoplakia, since these spots were likely to lead to epitheliomatous growths.

Dr. A. L. **Dean** declared that he was much interested in Dr. Townsend's case, which he had treated at the Memorial Hospital. He would like to hear the result of the pathologist's examination of the inguinal nodes in this case. Dr. **Rathbun** said he had had four cases of extirpation of the penis, but in none of these was the scrotum or its contents extirpated. One patient had died later of metastases of the lung; he had had no postoperative treatment. The others were alive several years after the extirpation; they had been subjected to x ray therapy after the extirpation. He had just completed a postoperative technic; instead of plastic surgery, he simply put in a few stitches, and packed the wound with iodoform gauze. Dr. Townsend replied by saying that he still felt that the more mutilation at the operation the greater the chances of success, particularly in the case recorded. Dr. **McCarthy** said that the point brought out in the history by Dr. **Killian**, that the improvement was marked after the passage of the calculus, was subject to considerable modification, inasmuch as it was not until the 8th that the calculus was passed, whereas it was on the 4th that the duodenal lavage was inaugurated, and on the 10th the blood chemistry findings showed 56 urea nitrogen and 9.2 creatinin. It was, therefore, a reasonable supposition that the great bulk of the improvement from the 4th to the 10th must have been due in large measure to the duodenal lavage rather than to the passage of the calculus, which occurred only two days prior to the 10th.

Dr. **Beer** said the case interested him from many points of view. One particular feature he hoped Dr. McCarthy could elucidate, namely, Was there any chance in this case, in view of the uric acid calculi, that the patient had a bilateral ureteral obstruction with uric acid stones? If there was no proof that he had not, the explanation on a reflex basis would not be accepted. Dr. Beer said he was greatly interested in the subject of reflex anuria, and had collected several cases. Personally he believed that reflex anuria could occur, but in view of the fact that this patient had stones that cast no shadow, a justifiable doubt existed as to whether the second ureter was not also blocked when the anuria set in. It was interesting to hear that Dr. McCarthy had been able to influence the kidney so favorably with the duodenal tube flushing; it was perhaps a new method of getting stones down the ureter.

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Letters to the Editor.

PLEA FOR INSTRUMENTS AND MEDICINES FOR PERSIAN PHYSICIANS

Brooklyn, N. Y., *July 31, 1923.*

To the Editor:

I am wondering if there are some of the members of the medical profession who would be willing to help out a fellow physician who is doing a fine work in far away Persia. Dr. Solomon Werda was educated in Long Island College about twenty-five years ago and returned to Persia, where he has been at work ever since, making bricks without straw, for the field is large and medicines and instruments few. Several times he has been robbed of most that he had, and had to beg his friends for help.

It has occurred to me that there might be some of the simpler and most commonly used instruments lying unused and practically discarded in some doctor's office that would be most useful to Dr. Werda. It would be a pleasure to us to know of any such, and to send them to him. I should be glad to forward any contributions to Dr. Werda. His need of medicines is quite as great, and what he can get are so expensive as to be prohibitive, and yet they are necessary.

Dr. Werda was within the war zone and some of his losses were due to that fact, perhaps because he was personally able to save the lives of five hundred soldier refugees when they were about to be surprised and captured by the Turks.

Rev. E. V. Collins.

Church of the Messiah,
389 Clermont Avenue.

MODERN MEDICAL KNOWLEDGE

New York, *August 19, 1923.*

To the Editor:

In looking over my medical journals nowadays I rarely find an article which teaches what avails in ordinary practice. Lately, it is true, we have to do with insulin as a remedy in diabetes. It was thought at first to be sure, without flaw. At present we know there are drawbacks in its use and unless the wise practitioner handles it, trouble or death may result. Of course, we know that the remedy is due to laboratory research and we are glad that the discoverer has received honors from the government (Canada), and abundant praise from his colleagues. And yet, is it not true already, that it may soon be displaced in practice by a modified fat more lately found and vaunted?

The fact is, despite all advances in medicine and surgery, we go around, as it were, in a circle. Things come and things go, but it still remains true that the old time remedies with the changes that many trials have brought in their use, still remain in the great majority of instances the agents we regard as most reliable and freest from possible great harm to the patient.

Everyone, almost, who reads the foregoing, will exclaim that the writer is a back number, and should not be counted. He merely rings praises over the past and does not, or cannot, profit by the present. To this criticism I fail to adhere, because if I did I should ignore and throw aside much, not to say all, of what I learned from former preceptors and lifelong experience.

What I should like to see today would be a medical journal filled with readable articles to guide and direct those men in general practice who are daily caring for ill patients at the bedside and not simply performing stunts in the laboratory and who, when called upon to minister professionally to the ill and suffering, are so scientific that they know, or do very little to help, or relieve. Cure is something they often retard, or prevent, by their doing, alas, whether it be medical or surgical.

Beverley Robinson, M. D.

Abstracts from Current Literature

GENITOURINARY DISORDERS.

Practical Experiences with the Intravenous Treatment with Glucose.—H. Planner (*Wiener klinische Wochenschrift*, August 17, 1922) relates his experiences at Finger's clinic in over one hundred cases, mostly of fresh secondary syphilis, with a ten to fifty per cent. glucose neosalvarsan solution. He found that this form of treatment had no great advantage over the ordinary salvarsan or combined salvarsan mercury treatment. He emphasizes the prompt symptomatic effect, but the permanent results did not come up to expectations—the general course of events presented the usual picture and early neurorecidives were also not avoided with this form of treatment.

Syphilis as a Cause of Antenatal Death.—J. N. Cruikshank (*British Medical Journal*, September 30, 1922), from a study of the Wassermann reaction in thirty-five hundred specimens of blood and the clinical records of one thousand pregnant women concludes as follows: 1. That between nine and ten per cent. of women of the hospital class in Glasgow show evidence of syphilitic infection; 2, that the results of the Wassermann reaction in the blood of the newborn are of little value in proving the presence of congenital syphilis; 3, that the incidence rate of congenital syphilis has been greatly exaggerated by most of the recent writers; 4, that maternal syphilis cannot be shown to be a factor of predominating importance in the etiology of the interruption of pregnancy in the earlier months; and 5, that syphilis is one of the most important causes of stillbirth and of the interruption of pregnancy in its later months, leading to premature birth, and, more particularly, to premature birth with death of the fetus.

Statistics on Prematurity and Congenital Syphilis.—With the aid of statistics, E. Kehrer (*Zentralblatt für Gynäkologie*, February 10, 1923) shows that syphilis does not play a very important part as the direct cause of premature births and that it certainly does not possess the great significance which has been ascribed to it, but that the prognosis for all children borne by a syphilitic mother is a grave one, and that, both during their intrauterine development as well as their susceptibility to external influences after their birth. According to the author's statistics, syphilis does not, as is generally assumed, cause sixty to ninety per cent. of premature births, but only seven per cent. On the other hand, it does frequently cause intrauterine death of the fetus and death of the premature fetus after its birth.

A Study of the Inorganic Constituents of the Blood Serum in Nephritis.—W. Denis and S. Hobson (*Journal of Biological Chemistry*, February, 1923) studied the inorganic constituents of the blood serum in twenty-two cases of nephritis and cardiorenal disease, with the following results: The sodium and chlorine showed a marked increase over the normal in only four cases; the inorganic phosphate fraction was increased in ten cases; the inorganic sulphates showed increased values in eleven instances; magnesium and potassium were more or less constant, and calcium decreased in five cases. In discussing these results the authors state that the contrast afforded by the behavior of the sodium and chlorine, on the one hand, as against phosphate and sulphate, on the other, justifies the suggestion that we have here a demonstration of the specific selective activity of the kidney towards the various normal inorganic constituents of serum, somewhat similar to the selective action which has been shown to exist for the various nonprotein nitrogen constituents of the blood. Sodium and chlorine are excreted with great ease and even in the case of the badly damaged kidney, retention of these elements seldom occurs; in this respect they may be said to resemble creatinine. The sulphate ion is apparently excreted with difficulty, so that in kidney insufficiency the concentration of this fraction may increase enormously; in this respect, the sulphate ion may be compared to the uric acid fraction, although the percentage increases observed are far above any concentrations of uric acid so far reported.

Chloride Retention in Experimental Hydronephrosis.—Norman M. Keith and D. Schuyler Pulford, Jr., (*Journal of Experimental Medicine*, February, 1923) produced hydronephrosis in dogs by partial obstruction of both ureters near the ureteropelvic juncture. Chloride retention, as well as the retention of water, urea, and phenolsulphonephthalein, occurred in acute hydronephrosis. If water and chlorides are equally retained in the body, the plasma concentration of chlorides will not rise appreciably. When chlorides are retained, but not water, there is an increased concentration of chlorides in the plasma. When the ureteral obstruction is removed all the renal functions, water, urea, and chloride excretion, may be rapidly restored in equal degree, or there may be a free excretion of water and urea, and a temporary chloride retention. The one example of chronic hydronephrosis studied showed that under the experimental conditions the chloride metabolism differed little from the normal. A polyuria seemed to be the compensatory mechanism which prevented any marked retention of chlorides, urea, or water.

A Study of the Relation of Treponema Pallidum to Lymphoid Tissues in Experimental Animals.—Louise Pearce and Wade H. Brown (*Journal of Experimental Medicine*, January, 1922) demonstrated that only forty-eight hours after inoculation of the scrotum of the rabbit, the inguinal nodes contain active Treponema pallidum; the syphilitic infection is sufficiently established after that time so that the primary lesion is no longer essential for its maintenance. Further experiments indicate that for long periods of time Treponema pallidum may be present in the lymph nodes of rabbits which have recovered from clinical manifestations of the disease, even though no further manifestations of the infection occur, and further that the reservoir of the organisms during latent periods of syphilitic infection is lymphoid tissue. This intimate relation of Treponema pallidum to lymphoid tissue is an essential concept of syphilis of the rabbit, and from this point of view the infection is primarily one of lymphoid tissue.

Focal Embolic Glomerulonephritis.—Margaret Warwick (*Journal of Laboratory and Clinical Medicine*, June, 1922) analyzes ten cases of focal embolic glomerulonephritis which occurred in the autopsy records of the Department of Pathology of the University of Minnesota during the past five years. The cases all showed enlarged spleens, the persistence of microscopic red blood cells in the urine, a varying phenolphthalein value, sometimes very low, and again approximately normal. Most of the cases were associated with the presence of the Streptococcus viridans; in one case, however, which showed the classical ulceration and vegetations of the mitral valves and presented typical lesions, Streptococcus hemolyticus was recovered from the blood, showing that streptococci other than the viridans may be responsible for focal embolic glomerulonephritis. In all ten cases the heart was enlarged; the mitral valve was involved alone five times; the mitral and aortic together four times, while the aortic alone was involved but once. The lesion consisted of vegetations sometimes accompanied by ulcerations of the valve leaflets. In the series there were also five cases showing multiple infarcts of the spleen, kidneys and often brain, confirming the theory that these lesions are the result of tiny emboli lodging in the loops of the glomeruli.

The Course of Syphilis and the Jarisch-Herxheimer Reaction; the Excretion of Mercury and Salvarsan in the Reaction.—Moriz Oppenheim (*Wiener klinische Wochenschrift*, January 4, 1923) observed 128 Jarisch-Herxheimer reactions among 180 cases of syphilitic exanthema. He comes to the conclusion that the cases showing intense reactions were those with a subsequently unfavorable course, developing recurrences in the liver, eyes, bloodvessels and nerves and fluctuations in the Wassermann reaction. During the reaction there is a greater retention of mercury or salvarsan in the body. The cause of this unfavorable course has not as yet been explained. Except in the cases that require abortive treatment, therefore, the author advises the avoidance of an excessive reaction and that the treatment should be commenced with a course of inunctions or other small doses of mercury before resorting to more energetic treatment.

Wildbolz's Own Urine Reaction.—After carefully describing the technic of this test and after reporting two hundred of his own cases and 2,300 cases in the literature, R. Kipfer (*Schweizerische medizinische Wochenschrift*, December 30, 1922) found that of 1,433 patients recognized clinically as tuberculous, 90.1 per cent. showed a positive Wildbolz reaction. If the cases that failed to show a skin reaction are excluded, there were 92.7 per cent. of positive results. Of 845 cases, in which the clinical methods of examination failed to show tuberculosis, 68.8 per cent. reacted positively; excluding infants, whose skin is unsuitable for this test and also practically unnecessary, there were 28.8 per cent. positive results. Most of the deviating results are explainable by sources of error which may be corrected. Some positive reactions in isolated cases of staphylococcus infection, typhoid fever, nephritis, malignant tumor, syphilis and progressive paralysis are still unexplained. The author concludes that the Wildbolz own urine reaction is a method of immunological diagnosis of tuberculosis of practically great importance, inasmuch as it is an advance on the previous clinical diagnosis of tuberculosis in its diagnostic breadth and is, therefore, a valuable complement of the latter.

Clinical Experiences with Wildbolz Own Urine Reaction.—Karl Schmid (*Schweizerische medizinische Wochenschrift*, March 8 and 15, 1923) found that in patients afflicted with tuberculosis the Wildbolz own urine reaction is produced by substances that are peculiar to this disease, that the positive result is not produced only by these substances, but also occurs in other diseases, as in carcinoma, and that in advanced, chronic bronchitides which do not appear to be tuberculous, positive reactions occur every now and then. According to some of the author's observations, it appears in place to investigate whether a positive nonspecific Wildbolz reaction may not occur in advanced age, particularly as a symptom of senility; probably as a result of a marked decomposition of albumin. In some cases of streptococcus and pneumococcus sepsis, analogous to the cases of nephritis and staphylococcus diseases of the urinary tract, a positive reaction also occurs. The reliability of the Wildbolz reaction seems to be impaired by the fact that the substances excreted in the urine and which are responsible for the reaction can be used only in very small amounts for purposes of inoculation and the test, therefore, must be frequently repeated.

Sulfarsenol in the Treatment of Syphilis and of Some of the Complications of Gonorrhea.—F. Carminow Doble (*Lancet*, January 13, 1923) states that sulfarsenol may be given intramuscularly or subcutaneously without causing great pain. Besides the increased therapeutic effect, the patient need not be subjected to starvation before and after the injection. The results are uniformly good. The spirochetes disappear from the lesions in twenty-four and forty-eight hours after an injection of this drug. The clinical results and the effect on the Wassermann reaction of the blood equals those of any other drug. The action on the spinal fluid is not so markea as that of silver salvarsan. In those cases, in which the other arsenicals could not be given, clinical improvement followed the injection of small doses of sulfarsenol, which were gradually increased. A Herxheimer reaction occurs in less than one per cent. of cases. There is no better drug for infants than sulfarsenol, provided the dose is controlled by the body weight of the child. Pregnant women can be treated up to childbirth and then mother and child can be treated separately. If pain occurs, it is probably due to the water not being absolutely fresh and sterile. The patient is not inconvenienced nor does he have to lose time from work. For the treatment of the complications of gonorrhea the intravenous route is the best. The author tried this drug in cases of arthritis, rheumatism, hyperkeratosis and epididymitis. The results were remarkably good, but the effect in epididymitis was extraordinary. The dose was 0.12 gm. followed in forty-eight hours by an injection of 0.18 gm.; if the pain returned, an injection of 0.18 gm. was then given, followed by another injection forty-eight hours later of 0.3 gm., when the temperature dropped and the pain disappeared permanently.

Therapeutic Action of Bismuth in Syphilis.—C. Levaditi (*Lancet*, March 31, 1923) states that sodium and potassium tartrobismuthate and metallic bismuth achieve rapid cicatrization of syphilitic lesions at all stages of the disease. Although bismuth has only been recently employed, he has every reason to believe that when used early and in sufficient quantity, it will cure syphilis. The absence of recurrences of the disease and the effect on the Wassermann reaction serve only to confirm this opinion. Equal, from a therapeutic point of view, to arsenical preparations, better than mercurical preparations, bismuth (trépol and neotrépol) is a valuable antisyphilitic remedy, particularly in those manifestations of the disease which resist the action of arsenic and mercury. In oily suspension this preparation is nontoxic. Insoluble preparations should be used for intramuscular injections, preferably in the superior gluteal area. The intravenous route is dangerous. The dose should be two c. c. (0.2 gram of the active preparation), repeated every three or four days, until a total amount of 2.8 or three grams has been reached. The series of injections should be repeated after an interval of a month, until the Wassermann reaction becomes negative.

Contraindications to the Intensive Treatment of Syphilis.—U. J. Wile (*Medical Clinics of North America*, March, 1923) deprecates the present tendency to treat disease by routine methods rather than the patient himself. Where visceral syphilis exists treatment may be required not only from the side of the syphilis, but from the viewpoint of the affected viscus as a dysfunctioning organ. Syphilis cannot be treated in any routine fashion, as this implies injudicious treatment, treatment that should not have been given at all, or overtreatment; each individual patient requires individual treatment according to the exigencies of the case.

The course of the treatment should be governed, in the first place, by the age of the syphilitic. A second factor to be considered is the duration of the syphilis; this also involves a difference in prognosis. A third factor is the presence of coincident disease other than syphilis. The next factor requiring consideration is the type of the syphilitic lesion present. Another important factor is the social status of the individual, taking into consideration the syphilitic as a carrier and disseminator of the disease. There are unquestionably many cases of old syphilis which should not be subjected to treatment, especially when the Wassermann reaction is interpreted as an absolute guide to therapeusis and an invariable indication, so to speak, for treatment. These are the patients who have received adequate treatment, who have lived their lives, and are useful members of the community, without danger to themselves or to the community, who have, so to speak, outlived their syphilis and yet whose blood tests are permanently positive—the socalled Wassermann fast cases. There is another group of syphilitics, in which treatment is utterly hopeless and may even result in real damage: it is hopeless in demented paretics (later stages) and it is dangerous in the very severe cases of myelitis and of tabes, in which so great a destruction of the cord has already occurred that there is complete paralysis and incontinence of both urine and feces; the same applies to the more rare cases of syphilitic transverse myelitis and other severe syphilitic injuries in the cord, excepting gumma of the brain or cord.

The first requisite in the treatment of syphilis is a complete survey and evaluation of the patient, not only from the viewpoint of his disease, but from the particular position he occupies in society, from the viewpoint of what can be accomplished by treatment, from the careful study of the predominating features of the disease, with due regard for the peculiarities of the particular system involved; also, what is most important, the acceptance of the fact that the biological test in itself is not of necessity an indication for therapeutic intervention.

Treatment of Epithelial Tumors of the Urinary Bladder.—Frank Kidd (*Lancet*, March 17, 24, and 31, 1923) concludes as follows: 1. Biopsies in cases of papilloma of the bladder are unnecessary and even dangerous, as about ninety per cent. of patients are cured by diathermy treatment through the cystoscope. 2. Even in some cases of doubtful malignancy a certain number of cures may be obtained in this way. 3. In cases of malignant papilloma, early papilliferous carcinoma, and even of early ulcerating carcinoma of the bladder, subtotal or partial cystectomy is indicated. Cases of partial cystectomy should be followed up at regular intervals by means of cystoscopy. 4. Total cystectomy has been almost replaced by partial cystectomy, diathermy, and radium. It should be reserved for cases of multiple malignant papillomata refractory to other treatment and for a few favorable cases of early carcinoma involving both ureteral openings. 5. Ureterostomy presents almost as great a risk to life as total cystectomy. It may be used as a preliminary to total cystectomy in a few favorable cases. 6. In the author's opinion, radium has not yet justified its claim to supersede surgery, but it has established a claim to the closest consideration. It has already replaced total cystectomy, combined perhaps with open fulguration and deep röntgen ray therapy. Socalled inoperable cases should not be simply drained or let alone; these bladders should be opened and treated either by open diathermy or fulguration combined with the implantation of radium emanation glass tubes, perhaps followed up by deep röntgen ray therapy and cystoscopic application of radium and diathermy.

The Cerebrospinal Fluid in Congenital Syphilis.—Max Frank (*Monatsschrift für Kinderheilkunde*, A. Czerny Festschrift, March 25, 1923) states that an increased amount of albumin, lymphocytosis, or a positive Wassermann reaction in the cerebrospinal fluid were found only in such cases as showed florid symptoms and in patients who were insufficiently treated or not treated at all up to the day of the lumbar puncture. With the aid of the gold sol reaction he was enabled to recognize a larger percentage of the cerebrospinal fluids of congenital syphilitic infants than pathologically, using only the reactions in ordinary use. By doing only a gold sol reaction on the cerebrospinal fluid of syphilitic infants in certain cases, which do not differ from other syphilitic children in regard to the results of the other reactions, the severe changes in the cerebrospinal fluid can be demonstrated.

The Present Conception of the Question of Metasyphilis.—E. Redlich (*Wiener klinische Wochenschrift,* March 8 and 15, 1923) says that there is no longer any doubt as to the syphilitic nature of locomotor ataxia and of general paralysis. However, the pathological, anatomical, and clinical phenomena are not as yet fully explained by the demonstration of the Spirocheta pallida, inasmuch as the investigation of this complicated question is still in its beginning, and therefore most of the hypotheses regarding the nature of locomotor ataxia and of general paralysis are still questionable. The assumptions of Gennerich are particularly objectionable.

Wassermann and Flocculation Tests: Compared in One Thousand Cases.—A. L. Urquhart (*Lancet,* January 20, 1923) concludes: 1. That the flocculation test gives as reliable results as the Wassermann reaction. 2. That the flocculation test is preferable to the Wassermann reaction on account of its greater simplicity. 3. That sheep's heart extracts make satisfactory antigens, and that similarity of antigenic property may be obtained by adjustment of the amount of cholesterol added to the heart extract. 4. That contamination of hemolysis in the sera may give rise to false positive readings and such sera should not be used in the test. 5. That the presence of bile pigment, or an anticomplementary state of the serum, does not interfere with the flocculation test.

Selective Action of the Kidney as Regards the Excretion of Inorganic Salts.—W. Denis (*Journal of Biological Chemistry,* February, 1923) injected solutions of various inorganic salts directly into the intestine of anesthetized dogs, and then analyzed samples of serum, and in some cases whole blood, taken at intervals over a period of several hours. Salt solutions were also injected intravenously, and the rapidity of excretion determined by blood analyses. The results indicate a selective retention on the part of the kidney for the sulphate ion, which in one case was found to accumulate in the serum to a value of 3,200 per cent. of its initial concentration. The salts used in this work were magnesium sulphate, sodium sulphate, magnesium chloride, sodium chloride, and sodium phosphate.

Outlook of Nephritis in Children.—Hugh T. Ashby (*British Medical Journal,* March 10, 1923) finds that about ten per cent. of patients afflicted with scarlet fever suffer from a subsequent nephritis. The outlook in these cases is generally good and the nephritis rarely becomes chronic. The amount of albumin in the urine seems to bear no relationship to the prognosis. The most serious cases are those which have received no treatment for several days and those showing suppression of urine, in which uremia may occur. The prophylactic treatment includes the avoidance of exposure to cold, particularly during the two or three weeks following the onset of the scarlet fever. The prognosis is usually bad in cases of acute nephritis, as they run a course lasting from three months to two years and complete restoration to health does not occur often. The patient may recover partially, but the recurrent attacks aggravate the damage to the kidneys until anasarca develops and death follows. Finally the urine is very much reduced in amount and dyspnea becomes very prominent. Uremic convulsions may also occur.

Functional and Anatomical Study of the Excretion of Hemoglobin by the Kidney.—Yoshu Fukuda and Jean Oliver (*Journal of Experimental Medicine,* January, 1923) gave male rabbits a moderate intravenous injection of normal saline or one hundred c.c. of water by stomach tube. Thirty minutes later the animals were catheterized and given an intravenous injection of hemoglobin solution in normal saline. At fifteen minute intervals the catheterization was repeated, the bladder each time being washed out with a known amount of water. In these specimens the amount of hemoglobin was determined. Ten such experiments were done. From the results obtained the authors conclude that the anatomical and functional findings in hemoglobin excretion are best explained by the assumption of a filtration of this substance through the glomerulus and an additional excretion of it by the tubule cells. Absorption of water aids in the concentrating process, and is most marked in the collecting tubules.

Syphilis of the Lung.—W. T. Munro (*Lancet,* December 30, 1922) states that acquired syphilis of the lung may occur in three conditions, namely, gummata, fibroid induration, and areas of consolidation and catarrh, of which fibroid induration is the most common. In these cases the initial lesion would appear to be at the right base. In the author's cases no patient was under thirty-five years of age. The shortest time between infection by the spirochete and symptoms referable to the chest was three and a half years. Antisyphilitic treatment in the early stages is to be recommended, but when the bronchiectasis is well established treatment is not likely to lead to improvement. Two cases of focal disease were found; both improved on treatment. This condition occurs in younger patients. Congenital syphilis of the lung may be of common occurrence and responds to treatment.

A Study of the Austin-Stillman-Van Slyke Index of the Urea Excretion.—Charles H. Hitchcock and Ruth Loveland (*Bulletin of the Johns Hopkins Hospital,* August, 1922) determined the Austin-Stillman-Van Slyke urea excretory coefficient in twenty-seven cases. They found a definite lowering of the value of the coefficient in borderline conditions, as well as in cases presenting marked evidence of renal damage, and during the relapses of pernicious anemia. They conclude that the use of this index may be of value in demonstrating renal insufficiency, and it is particularly worthy of study in borderline cases.

Byeffects of Arsphenamine.—Ernst Slawik (*Monatsschrift für Kinderheilkunde,* A. Czerny Festschrift, March 25, 1923) states that the byeffects of arsphenamine are usually of a harmless nature. However, it is a source of danger to the infant in febrile processes, which must be considered as a strict contraindication. It must also be feared in decompensation; the arsphenamine must not be discarded entirely from the beginning, but it must be administered very cautiously under constant control of the gastrointestinal symptoms; with the signs of not being well tolerated, which is determined chiefly by the weight curve, further treatment with arsphenamine should be discontinued possibly for several weeks.

CARDIOVASCULAR DISEASES.

Diagnosis of Endocarditis.—George R. Herrmann (*Medical Clinics of North America*, March, 1923) asserts that the diagnosis of subacute bacterial endocarditis in cases with persistently negative blood cultures must be made only after thorough study of the case which presents some of the characteristic signs. One positive blood culture is not to be considered sufficient basis for the diagnosis which has such a grave prognosis, unless symptoms and signs fit into the picture. A systolic murmur over the heart in cases with fever should not be considered too seriously; diastolic murmurs always demand more serious consideration and certainly lend considerable weight to the diagnosis of a subacute bacterial endocarditis. It is important to secure exact details in the physical examination. The murmur of the congenital heart lesion may easily be misinterpreted. The diagnosis of an exacerbation of rheumatic endocarditis may be made because of the absence of evidence of embolism and infarction before the onset of cardiac failure. Positive blood cultures may be obtained with comparatively little difficulty and therefore repeatedly negative blood cultures acquire considerable significance. The facts necessary for a diagnosis of subacute bacterial endocarditis are principally these: the signs of a definite organic heart lesion, of a prolonged sepsis with fever and anemia, and of embolism; positive blood cultures added to these findings make the diagnosis practically certain.

Acute Intermittent Cardiac Decompensation.—Elsworth S. Smith (*Medical Clinics of North America*, July, 1922) finds that the most characteristic feature of this group of cases is the intermittency of the attacks of decompensation. The attacks occur suddenly, mostly in the early morning hours, with a severe dyspnea progressing to cyanosis and ending in orthopneà with cold, clammy sweats and a rapid and at times imperceptible pulse; also cough, with bloody, frothy expectoration, often copious, numerous bubbling râles over the bases of the lungs, especially posteriorly, and resulting edema and circulatory collapse. Prompt medical aid may prevent a fatality. The treatment of these cases includes that of the attack and that of the intervals. During the attack, if arterial hypertension is present, one fiftieth grain nitroglycerin is given hypodermically and repeated every fifteen to thirty minutes as necessary, and one twenty-fifth grain of reliable digitalin should be given every half to one hour, and one twentieth to one thirtieth grain strychnine sulphate as required. To calm the patient's mind, one fourth grain morphine and one fiftieth to one one hundredth grain of atropine sulphate are given and repeated as necessary. An ampoule of camphor is given hypodermically every fifteen minutes until the patient rallies. Oxygen relieves the cyanosis. If there is no arterial hypertension the treatment is practically the same, with the exception of the omission of the vasodilators; if the symptoms of angina pectoris predominate, morphine may be used freely.

During the intervals between attacks, arterial hypertension must be controlled by the elimination of coffee, tea and nicotine; alcohol may be allowed in moderation to those accustomed to its use and to the feeble, provided there is no serious grade of nephritis. If the nonprotein nitrogen in the blood is excessive, a low protein diet is indicated, especially with an impaired renal function. Focal infections must be sought and eliminated. All the emunctories of the body should be kept in an active state. Vasodilator drugs should be kept in reserve for the attacks or continued over periods when there may be a tendency to repetition of the attacks from high blood pressure, or when the hypertension proves intractable to treatment. For administration over longer periods of treatment, sodium nitrite, in doses of one to three grains daily, or erythrol tetranitrate in 0.5 grain doses, both given three times daily, are preferable; sodium or potassium iodide in ten to twenty drop doses, well diluted, may also be used. Bromides help with a severe nervous element. In the involutionary type of arteriosclerosis without hypertension, the excessive use of salt should be controlled. Syphilis should be looked for and in its presence iodides are indicated. Undue physical effort and dietary indiscretions and venery should be avoided.

Use of Quinidine in Auricular Fibrillation.—Francis R. Fraser (*British Medical Journal*, March 24, 1923) comes to the following conclusions: 1. Quinidine treatment will result in a stable normal rhythm if the cause of the auricular fibrillation can be successfully treated or has ceased to be active. 2. Cases in which there are extensive structural changes in the heart are not suitable for quinidine treatment, especially if the response to digitalis is not good, as dangerous symptoms may result. 3. In some cases at least the comfort and efficiency of the patient are greater when a normal rhythm results from quinidine treatment than when digitalis treatment alone is used. 4. In the cases in which the results are satisfactory larger doses than ten grains of quinidine sulphate at intervals of six hours were not necessary, nor smaller initial doses than five grains three times a day. 5. If necessary to maintain normal rhythm, quinidine may be continued to be administered indefinitely in doses of at least five grains three times a day, and it is probably advisable in all cases to continue it for some weeks after normal rhythm has resulted, though in gradually decreasing doses.

An Experimental Investigation of the Pharmacological Action of Quinidine.—D. E. Jackson, Alfred Friedlander, and J. V. Lawrence (*Journal of Laboratory and Clinical Medicine*, March, 1922) studied the action of quinidine on the irregularities of the hearts of dogs, caused by aconite, digitoxin, and barium. These drugs were chosen because they set up cardiac arrhythmias more nearly like the cardiac irregularities occurring clinically than any others. From their experiments they state that quinidine undoubtedly acts on both auricles and ventricles; it tends to counteract the development of fibrillation of the ventricle after such drugs as aconitine or digitoxin. One of the earliest actions on the normal heart is a slight dilatation of the ventricle as shown by the cardiometer. The authors surmise that in due time it will be found that quinidine acts on the musculature of the peripheral vessels, and perhaps even on the skeletal muscles, in a manner similar to that in which it acts on the heart muscle. The decrease in the power of adrenaline to raise the general blood pressure after quinidine may indicate an action on the sympathetic innervation.

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RADIOTHERAPY.

Technic of Diathermy and Indication for Its Use.—R. Grünbaum (*Wiener klinische Wochenschrift,* January 11, 1923) has improved his technic of diathermy therapy of chilblains to such an extent, that he uses this treatment even in the severest cases of frostbites. For example, have the patient place the tips of his toes in running water and apply the other electrode to both thighs, with the result that the current flows from the tips of the toes through the entire leg and thus affects a large vascular area. In addition to frostbites a suitable field of diathermy treatment are the diseases of the accessory nasal sinuses, cicatricial bands and abdominal adhesions; also chronic parametritis and perimetritis.

Use of Radium in the Treatment of Disease.—Dawson Turner (*British Medical Journal,* March 17, 1923) found radium useful in malignant disease, exophthalmic goitre, splenomedullary leucemia, Hodgkin's disease, keloids and nevi. The malignant affections included rodent ulcers, epitheliomata, lymphosarcomata, spindlecelled sarcomata, malignant disease of the cervix, sarcomata of the nasal passages. Second class subjects, those which may be ameliorated but not actually cured, are carcinomata, lymphadenomata and splenomedullary leucemia.

Small, rodent ulcers not affecting the mucous membrane or bone are easily cured by a dose of five hundred to eight hundred milligram hours through a filter of silver 1.5 millimetres thick; smaller doses may allow a recurrence. Rodent ulcers near the alæ nasi and those on the ear or just below it are more refractory. Unless completely cured by the first treatment they tend to become radioresistant and further exposures may be harmful. Small epitheliomata of the lip are quite amenable to surface applications, but when the floor of the mouth, tongue, or fauces are involved, it is difficult to benefit materially the condition with radium. Lymphosarcomata are the most susceptible to radiations. In gynecology the best results are obtained in malignant disease of the cervix with six thousand to ten thousand milligram hours at the first treatment.

In the treatment of exophthalmic goitre and of nevi in children by radiation, radium has the following advantages over x rays: 1. Absolutely constant emission of rays, and therefore exact dosage is possible. 2. Greater penetration of rays, so that the deeper parts are reached. 3. Saving of time (radiation night and day). 4. The elimination of noisy, exciting apparatus, which can be applied at the bedside without alarming the patient.

Röntgen Injuries and Deep Röntgenotherapy.—W. Latzko (*Wiener klinische Wochenschrift,* March 15, 1923) aims to avoid the severe injury to the circulating blood. Starting from the assumption that with an irradiation lasting several hours the bloodvessels of the pelvis and of the abdominal viscera circulate the entire mass of blood of the body many times and that consequently the blood is subjected to the influence of the röntgen rays in a very intensive degree, it seems plausible to exclude a large portion of the blood from the circulation during the irradiation so as to eliminate the effect of the röntgen rays upon a large portion of the blood. This the author endeavors to accomplish by constriction of the lower extremities during the treatment with elastic bandages, so that a considerable congestion results. The blood retained in the lower extremities in this manner is completely or almost completely protected from the effects of the rays. After the exclusion of the circulating blood, those organs and tissues which must be made responsible for the severe injury of the general condition should be protected from the rays. The work of the future lies in finding new ways of accomplishing this.

Treatment of Malignant Disease by X Rays.—J. H. Douglas Webster (*Lancet,* February 24, 1923) subscribes to the views of Schmieden and Holfelder, which represent what may be called cautious progressive present day opinion: 1. With few exceptions every operable carcinoma should be operated on, with prophylactic postoperative irradiation in addition. 2. In addition to postoperative irradiation a single intensive irradiation before operation is coming to be considered important. 3. Practically all inoperable carcinomata and all inoperable recurrences should be irradiation. This gives in many cases clinical cure, in others it results in operability, often less bleeding, irritation and pain, as well as limitation of further metastases. 4. Facial carcinomata, even when operable, can well be treated exclusively by irradiation for cosmetic reasons. 5. Sarcomata, as a rule, should only be irradiated, certainly in all cases in which operation would cause considerable bodily mutilation. (Any increase in size of the tumor after an efficient irradiation should not be considered proof of failure to respond, as it is usually only temporary.) 6. In the treatment of malignant tumors, along the whole line, x ray work has become superior to radium treatment, except in the form of the American radium technic of burying numerous small tubes and of massive surface irradiation from a distance. The time has not yet come when statistics can show the comparative values of operation or irradiation in the treatment of malignant disease.

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Present Day Treatment of Asthma*

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The modern treatment of asthma is based upon the principles of desensitization in animals, introduced by Besredka. He found that a sensitive animal could always be rendered specifically and completely insensitive by a suitable and gradual neutralization of antibodies, which are responsible for the hypersensitiveness (desensitization). In 1911, Freeman and Noon (1, 2) in England, and Dr. Robert A. Cooke (3), independently in this country, made successful use of this concept in the treatment of hay fever and asthma.

It is immaterial to the patient, whether the process involved is that of actual desensitization or not. He is concerned only with the results obtained. As a matter of fact, the process is not that of desensitization, for we must distinguish between anaphylaxis, or animal hypersensitiveness, and allergy, or inherited hypersensitiveness in human beings. Dr. Arthur F. Coca was the first to differentiate the two (4).

In brief, some of the differences between the two are:

1. In anaphylaxis, the exciting agent is antigenic (capable of producing specific antibodies). In allergy, the exciting agent is often not antigenic, it may be a drug; no specific antibodies are produced.
2. Anaphylaxis requires two injections, one to sensitize and the second to shock. In allergy, first contact often is sufficient.
3. Anaphylaxis is artificially induced; allergy s inherited.
4. In anaphylaxis, complete desensitization is always successful. Not so in allergy; positive skin reactions always persist, although they may be modified. A small dose of a specific protein, for example, in hay fever, has been known to stop all symptoms for several years. This is unknown in anaphylaxis. In fact, after a time the animal becomes more sensitive.

What the actual process in human beings is, we do not know. For practical purposes, however, the treatment of asthma divides itself into, first, the treatment of the paroxysm and secondly, the interval treatment. Cases of dyspnea due to renal or cardiac disease, the socalled renal and cardiac asthma, are not included in this paper.

The actual attack is controlled most efficiently by adrenalin. To obtain the most beneficial results, the adrenalin must be administered early, repeated as necessary, in doses of five to ten minims, rather than in large single doses. Rarely, it is necessary to use adrenalin intravenously. Other drugs used are atropine, morphine, heroine, cocaine, nitrites, iodides, benzyl-benzoate, and the inhaling powders with stramonium leaves as a base. The complications accompanying cases of long duration, such as chronic bronchitis and emphysema, are often benefited by the use of autogenous sputum vaccines. The foci of infection, such as diseased sinuses and tonsils and carious teeth, have to be treated independently of the asthmatic condition, and the patient is often greatly benefited by prompt and thorough attention to these defects.

A word or two might be said here of climate. Except for the accidental absence of a causal factor in the asthmatic condition, climate *per se*, has only a limited value, in so far as it may benefit an accompanying bronchitis and emphysema. The rational treatment of asthma, however, is specific, consisting in the determination of the primary causal factor, its removal, and the therapeutic injections of extracts of the offending proteins or other substances.

The special diagnosis is made by two or more of the following four cardinal methods:

I. Contact—Symptoms of asthma following contact with a protein or other substance. (For example, a little girl who had an asthmatic attack every time she played with a cat).

II. Removal.—Symptoms of asthma disappearing upon removal of offending protein or other substance. (For example, asthma disappearing when rabbit hair pillow was removed from home.)

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*From the Department of Bacteriology and Immunology, Division f Immunology in Cornell University Medical College, and the First Medical Division of the New York Hospital. Read before the New York Physicians' Association, March 29, 1922.

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III. Diagnostic injections.—Symptoms of asthma produced by injections of a small amount of extract of suspected substance as, *e. g.*, 0.01 cc. of horse serum or 0.01 c.c. of ragweed pollen extract.

IV. Therapeutic injections.—Symptoms of asthma disappearing after injections of extracts of the offending substance. (For example, ragweed asthma disappearing after a few injections of ragweed pollen extract.)

The means at our disposal for the determination of the specific causal factor are 1, a careful and thorough history, and 2, the skin tests.

In obtaining the history, special inquiry is made as follows:

1. *Family history of hypersensitiveness.*—Cooke and Vander Veer (5) were the first to show that heredity played an important part in this condition.

2. *Occupation.*—The occupation of the patient himself or of other members of the family is ascertained. An illustration of the importance of occupation is seen in the case of a longshoreman, who changed his occupation to that of a porter in a department store. His duties were to sweep the floors. Within a week he had violent attacks of asthma. He was found to be sensitive to sachet powders, and upon resuming his former occupation his attacks promptly ceased. Another case that may be cited is of a lady whose attacks occurred with the return of her husband from work. Investigation showed that he was a furrier, working with rabbit skins, and that his asthmatic wife was sensitive to rabbit dander.

3. *The attacks.*—Inquiry is made as to their frequency; seasonal variation if any; time of occurrence, day or night; relationship to food; proximity to animals or plants, bedding, surroundings, etc. Did the attack follow infection, serum injection, change of diet, change in occupation, change in environment?

In determining the specific etiological factor in asthma, the skin test is the foundation of our diagnosis and therapy. It is common knowledge that the skin almost always carries cells hypersensitive to the same substance that affects the bronchial mucous membrane. We, therefore, happily have a most excellent means for specific diagnosis.

There are two methods of testing the skin; the scratch method, introduced by Schloss (6), and the intradermal method, introduced by Cooke (3). In the *Journal of Immunology* (7) a detailed comparison of the two methods appears. There can be no question that the intradermal method used by Cooke and his school is by far the more accurate. The materials used in the skin tests were also compared, in a commercial preparation in powder form and a liquid preparation made by Dr. Arthur F. Coca, in the laboratories of the New York Hospital, standardized by nitrogen content. The methods of preparation of these test materials will be found in the same journal (8).

The superiority of the liquid preparation by the intradermal method over the dry scratch method may be summed up as follows:

1. The intradermal tests are easier to do.
2. Less time required to perform the intradermal tests.
3. The intradermal tests are more convenient, the same preparation being used for diagnosis and for treatment.
4. The intradermal method has a greater diagnostic accuracy.

There are two classes of substances used for testing the skin; those that are ingested and those that are brought in direct contact with the bronchial mucous membrane, termed the inhalant group. Of the two, the inhalant group is by far the more frequent offender in asthma, being responsible for about ninety-seven per cent. of the diagnosed cases. The inhalants are: the feather preparation—chicken, duck and goose epithelium; the animal emanations—cat, dog, horse, rabbit, sheep and goat, etc.; the pollens—ragweed, timothy, etc.; the sachets—orris, cornmeal, rice bran, cornstarch, etc.; dusts—house dusts and occupational dusts; tobacco, the insect powders, wheat and many others. The foods cover the entire dietary list—fish, meat, vegetables, fruits, etc.

One one hundredth of a c.c. of each extract of these materials is injected into the skin of the outer surface of the arm forming an elevation of two to three mm. (one eighth inch) in diameter. A tuberculin syringe, graduated in hundredths, and a twenty-six gauge needle are used. Readings are made in five to ten minutes, and positive reactions are determined by the formation of a wheal with an area of erythema surrounding it. To be of diagnostic significance the wheal must be over 0.5 cm. in diameter, and show pseudopod formation. Positive reactions must always be confirmed on later tests with the same substance.

Delayed reactions may occur in twelve to twenty-four hours after the test, manifested by a zone of hyperemia which may extend from one half to four or five inches in diameter. The exact clinical significance of delayed reactions cannot be definitely stated at the present time, but enough cases occur where clinical history of trouble bears out the tests to warrant us in excluding from diet any foods (for delayed reactions occur almost entirely with food extracts) which show such reaction.

Patients are tested with extracts of the inhalants and the principal foods as a routine measure. About ten to twelve tests are made at a sitting, the exact number depending on the patient's susceptibility. Children and patients with histories of violent attacks are tested very slowly, with the use of but few tests and weak solutions of extracts. Use may also be made of the conjunctiva for testing sensitiveness, with small amounts of extracts being instilled into the eye. A positive reaction is manifested by itching and palpebral and ocular conjunctival injection.

In the few cases, where the skin reaction is negative and the history is strongly suggestive of a specific factor, a small amount of the extract of the substance may be injected subcutaneously or the food may be eaten directly, occasionally evoking mild attacks of asthma. This may be called the direct method. Therefore, in order to undertake the rational treatment of asthma, the correct diagnosis is essential and both the history and skin tests should point to the same etiological factors.

Treatment in the sensitive cases involves: 1. The removal of the offending substance; for example, the removal of feathers from the bedroom, if a person is hypersensitive to feathers. 2. Injections of extracts of the substance to which the patient is hypersensitive, beginning with minute doses, increasing every five to seven days as the case may require, until the person is free from symptoms. If the symptoms still persist, it means that some other etiological factor has been overlooked.

Treatment can be illustrated by a few specific cases:

CASE I.—J. R. O., office clerk, aged twenty-eight, married, applied for treatment on January 18, 1921. He gave a history of having had asthma for two years, the attacks occurring weekly, and lasting from one to twenty-four hours. The patient had a cat and dog at home. He was worse at night. Skin tests showed him to be sensitive to chicken epithelium, house dust, beef, fish and bananas. He was ordered to get rid of his feathers, to sleep on a silk floss pillow and to have his bedroom thoroughly cleaned of dust and kept so. He was ordered to omit beef, fish and bananas from his diet. Injections of chicken epithelium 0.05 c.c. strength .43 mg. of N to 1.0 c.c. were started, the doses being increased weekly until 0.8 c.c. was given. He began to improve almost immediately and had been free from all symptoms for over a year. During the treatment he gained fourteen pounds in three months.

CASE II.—E. C., aged twenty-one, single, bookkeeper, applied for treatment January 27, 1922, with a history of having had asthma for two years, the attacks at first occuring weekly and lasting a day or more. His attacks occurred both day and night, and for five weeks prior to the consultation his attacks were continuous, requiring administration of morphine and adrenalin. He had a complicating bronchitis. Physically, he was markedly anemic, and showed defects of the nose and throat. Skin tests showed him to be sensitive to feathers, goat dander, house dust, cauliflower, tea and salmon. Goat hair was found in his home and removed. He was started with injections of goat dander one twentieth c.c., also house dust one tenth c.c., until he received one c.c. of each two months later. He was free from all symptoms within one week of the first injection and gained seven and one half pounds in the first month.

CASE III.—L. F., aged nine years, was seen first on January 20, 1921. She had had asthma and bronchitis since the age of two. Attacks occurred every few weeks, and were worse at night; the tonsils and adenoids had been removed a year ago. The patient was found by skin tests to be sensitive to cat, oatmeal, and house dust. Treatment began with injections of extract of cat epithelium, strength .6 mg. of N to 1.0 c.c., first dose, .005 cat epithelium to final dose of .3 c.c. All symptoms disappeared within one month, and there has been no recurrence of attacks of asthma since.

CASE IV.—M. E., aged eight years, was seen first on October 16, 1921. He had bad attacks of asthma every month, lasting three to four days, for seven years, with nightly dyspnea. The patient was found by skin tests to be sensitive to rabbit epithelium and dust. Rabbit hair pillows were found in his home and removed. Treated with rabbit epithelium .005 strength .6 mg. N to one c.c., until eight tenths c.c. was given. Pillows removed from home, symptoms ceased almost immediately, and he has been absolutely free from all symptoms for over six months. He gained ten pounds in the first two months of treatment.

CASE V.—I. S., aged eight years, was presented for treatment on February 1, 1921. He gave a history of having had asthma for four years, attacks occurring at monthly intervals, lasting three to four days. He had nightly dyspnea with attacks of vomiting and wheezing on eating eggs. His tests showed sensitivity to rabbit dander, cabbage, carrots, celery, green peppers, chicken meat, salmon, ovomucoid and egg albumen.

His tonsils and adenoids were removed at the age of two and one half years. His diet was restricted to the omission of the foods mentioned above and the rabbit hair pillow found at his home was removed. Treatment began with injections of rabbit epithelium 0.05 c.c., strength, 0.6 mg. N to 1 c.c., doses increasing every week until .9 c.c. was given. All his symptoms ceased within ten days, and he has had no attacks since.

Some cases require injections of more than one substance. Foods can be eliminated, but inhalants not so readily. A patient may rid his home of his cat and dog, to which he may be sensitive, but the house dust will still contain the dust of these animals for some time. Hence, it is necessary to treat such cases with therapeutic injections of these extracts. The particular extract to use must depend on the particular case. Very sensitive people should be started with a very minute dose, increasing very slowly, watching for local or general effects of each injection.

Great care must be exercised in treating people who give a history of marked paroxysms. The nonsensitive cases, comprising about twenty per cent. of all, are treated symptomatically. These patients are nonsensitive, only in the sense that at the present time we are not able to ascertain the substance to which they may react. Future experience will most probably reduce this percentage.

All cases of asthma, however, irrespective of cause, should follow a few general rules:

1. Patients should sleep alone in a room. The walls of the room should be painted instead of papered and be free from rugs, curtains, and furniture generally. An army cot with some washable blankets is ideal. A small washable floor rug may be allowed. Mattress and pillows should be made preferably of sterilized horse hair or silk floss.
2. The room should be thoroughly cleaned and kept so.
3. Concerning diet, patients must not overload their stomachs. They should eat five to six times a day, in small amounts, rather than three large meals; the heaviest meal should be eaten at noon.
4. Constipation must be corrected.
5. Patients must not overexcite themselves, must avoid haste, walk slowly, stopping occasionally.

These ordinary, sensible, hygienic rules are important contributing factors in minimizing the intensity and even the frequency of the patient's attacks.

To illustrate the types of asthma one meets with respect to etiological factors, the following one hundred tested cases may be considered.

100 CASES OF ASTHMA.

Sensitive, 83.
  41 had chronic bronchitis and emphysema.
  3 had pulmonary tuberculosis.
  39 were uncomplicated.
Nonsensitive, 17.
Sensitive, 83.

Dust—including special	47
Chicken epithelium	21
Sachets (orris, rice, etc.)	20
Cat epithelium	14
Ragweed	11
Rabbit epithelium	10
Duck epithelium	8
Goose epithelium	2
Dog epithelium	2
Cotton	2
Timothy	1
Goat epithelium	1
Tobacco	1
Total	140

In conclusion, there are a few essential facts that must be emphasized.

CONCLUSION.

1. Asthma is an allergic not an anaphylactic manifestation.
2. The causative factor in asthma is ascertained in a large percentage of cases and in these cases satisfactory results are obtained by the methods outlined above.
3. By skin tests we can determine potential hypersensitiveness.
4. The intradermal method of performing the skin tests is the method of choice because of its greater diagnostic accuracy.
5. Positive skin tests must be borne out by history, to establish suspected substances as etiological factors.
6. Eighty per cent. of cases give a positive skin test.
7. Of these about ninety-seven per cent. in adults and ninety-five per cent. in children are due to inhalants.
8. A small percentage of cases are due to food proteins.
9. The treatment of asthma is specific and consists of 1, removal of offending substances, and 2, therapeutic injections of extracts of offending substances.

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Physical Therapeutics

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The American Medical Association recommends that instruction be given in medical schools in the use of remedial measures other than by pharmaceuticals, and includes dietetics. The objectives are, so they seem to me, the maintenance and restoration of balance between energies and structures. The process should be a continuous clinical performance of diagnosis and of treatment, to overcome defective or morbid conditions as they appear urgent, or as they come to be revealed in their nature and extent.

These readaptative agencies may include any or all reliable measures or instrumentalities applied from the outside, and also those initiated and guided from within, through volition. They are compounded of scientific elaborations of the best in the resources of nursing, of home or simple remedial measures, of personal hygiene, and of whatsoever modalities of motion are calculated to achieve poise in structures, to release them from positions of disadvantage, and to replace them in positions of advantage, in order to expedite económic functioning. The enterprise may be called orthokinetic therapeutics, a readaptation through some modality of motion.

They consist of, first, things done upon the individual—induced motion—such as manipulation, replacement, pressure, counterpressure, support of fixation in order to place parts in positions of advantage, also of heat, cold, light, electricity, rays and such other mechanical instrumentalities as shall prove most efficient in the particular instance.

Second, such things as can and should be done by the individual through the voluntary use of performance of his motor parts, whether guided from without or initiated from within, as are best calculated to restore motor function. The aim would seem to be a reestablishment of structure and the harmonious working of the whole organism. This second objective is coming to be appreciated as of equal or superior efficacy to the first.

Induced forms of motion may include: applications of power from without, beginning with the hand as an instrument of convenience, intelligence, and precision, through socalled manipulation, coadaptation, support, also through appraising and suggesting, partly through touch perception, gentle pressures, tactile awareness of conditions as found, also of effects of harmful conditions, deviations or alterations in surface and deeper structures, in changes in sensitiveness, in resistance, in tone—overtone or undertone. Through the tactile corpuscles can be exerted a nice apperception and interpretation through muscle sense (kinesthesis) and the determination of capabilities for response, through directing economic selfadjustment, through reducing prodigal expenditures of energy, and enhancing the power of weakened energies, all making for a state of poise, of balance, of harmonious movement from zero or rest to maximum, by increments or decrements of effort or volition.

The directing self becoming out of gear—as it frequently does—demands employment as required in connection with other measures, and is of paramount importance. Occasionally all that is needed in the case is to reestablish harmonious interaction between psyche and soma, to secure efficient adaptation and to restitute capabilities. Disability, even decrepitude, is often the effect of this conflict or imbalance between psyche and soma.

Thus the purpose is to bring about complete harmony between structures and inherent, impelling, guiding or restraining forces. These forces include those for defense, for construction, for reconstruction, and for reestablishment. They demand for their integrity expenditures of energy in accord with the then (momentary) state of volition and group structures and in accord with other circumstances. They become modified profoundly by fluctuating states of emotion—commotion—by the persistence of primal impulses, instincts, complexes, feeling reactions, all down the line of phylogeny. These confusions flare out often unaccountably on coming in contact, or in conflict, with a bewildering array of ultracomplex, often unnatural, conditions and obstructions. Hence these trends or tropisms or instincts must become understood, if possible; at least they must be reckoned with and allowed for.

Some familiarity is desirable for the clinician with the various instrumentalities, devices, and also of proficiencies in the use of the hand as adaptator or adjustor of action patterns in energies, latent, depressed or overacting—to the neuromuscular and other organic mechanisms.

The chief reason why physical therapeutics have failed to meet with the interest and confidence they deserve, it seems to me, is that so many of the instrumentalities used have been exploited in such mysterious guises, forms and elaborations, as to discourage their adoption by those who are either less mechanically minded, or whose familarity with biophysics or the associated sciences of electrology, röntgenology, or radiology, is too small or inadequate to afford confidence in their employment.

This hesitation is well founded in the main, since an insufficient knowledge of those principles leads to futilities or to harmful, or at least undesirable effects. Now that so much well verified knowledge and experience is available as to the value of active movements, these now form an enormous group of clinical resources coming steadily into confidence, and will enable successful issues to be achieved beyond any grounds or belief prevailing a few years ago. So of the simpler, homlier, applications of the nursing art and of socalled home or simple remedies. These have now become capable of alone doing more than most of the specific medications of fifty or a hundred years ago. They may be visualized as amplified measures for convalescent economies—whether from acute or protracted states. The effects of disease or injury, especially of chronic processes, resemble an obstacle race—each obstruction should be removed in order to restore, as far as possible, normal conditions.

The resources of physical therapeutics may be further divided into those which are exhibited chiefly on the periphery and those which are applied to structures most near to centres, spinal or sympathetic, or subcentres, through metameres and the lines of innervation through ganglia.

Most of the more graphic, impressive and mysterious among the modalities of electricity, röntgenology, radiology, etc., reach only, or chiefly, surface structures. Some can now be shrewdly guided so as to drive deep into structures, as e. g., in diathermy. So of röntgen rays and radium, which are now becoming to react with precision and to do what is wanted with the minimum of byeffects.

Let stimuli—expended at or near the surfaces or on the periphery—be as forceful and efficient as they may, still they are merely partial and superficial in comparison with mechanistic forces exerted upon or near centres, subcentres, upon nerve emergencies or nerves in continuity.

Effects desirable and obtainable through pressures, impacts, or vibrations or tractions upon or near the centres, are as yet little known, and less appreciated. When they come to be studied with the same exactitude as those applied to the periphery, their vastly greater, more direct reactions will cause them to become more generally employed. As to choice, "let each man at arms use that weapon best fitted to his hand."

Many means are now available for affording relief to disorders or their effects, direct and indirect, through readjustments of position and attitude, restoring interrelationships of organs and of supporting structures. Position or posture is the sum of the effects of adaptation in accord with makeup, or conformation, many of which are often faulty; attitude is the sum of the assumed adaptations through habit or in accord with local peculiarities or weaknesses, as of the static, locomotive, or supporting structures. These deserve careful appraisement and correction. There follows, then, greater economies of functioning, as the respiratory, digestive, genitourinary, circulatory, vasomotor, visceromotor, pilomotor functions.

Some faults of interrelationship can be corrected by induced movements, manipulation, readaptation, as of the abdominal viscera; others can be restituted through carefully directed and guided voluntary movements, whereby better habits of attitude can be learned, and above all practised, till they are radically overcome. One form of disorder is common to most humans, viz., inadequacy of colon emptying, whether there be hypertonic or hypotonic constipation or a delayed peristalsis with prompt, even too frequent, evacuation of the lower bowel. The desideratum is restored intestinal tone, a motor adequacy throughout. The defect may be in the external abdominal walls, especially the thoracic or pelvic diaphragm, or in other associated muscles, as of the psoas, quadratus lumborum, iliaci, etc. The cure is twofold, 1, induced movements upon the disordered centres, and 2, better positions of advantage to function while at stool. So also of parturition, a normal attitude is more economic and safe. (Prompt obedience to the impulse.)

In short, the scientific adaptation of many homely principles of personal hygiene often prove quite sufficient to restore impeded function. Nature has supplied us with no end of resources which, when used judiciously, will maintain health or restore health. It is up to each of us to recognize their efficiency and make faithful use of them. "Let the punishment (or accomplishment) fit the *time*" and occasion, or obvious need. The economic use of our endowments should be competent to so subserve and conserve our needs as to reduce or do away with almost all (drug) artificialities. This it is the great purpose of physical therapeutics.

One word about poise, balance, harmony, as the essential condition for health or repair. Body commotions are due largely to emotional imbalance. This tends to cause irregularities in force transmutation and application; hence occur some form of tremor, ataxia, explosion, or cramp. The main desideratum of repair, restoration, is equilibration. In order to secure this poise, my experience gives me confidence in teaching the muscles to work as well in the negative, as in the active, phase; that is, when conscious power is withdrawn to come to complete equilibrium or rest.

By inducing conscious control of the limb or muscle group, by graduated increments of force from zero to maximum, say two or three times, then by concentrating attention on the withdrawal of energies, akinesia, there can be established a complete harmony or poise between movements and thus restore use. Thus, a state of consciously controlled negation, or inhibition, or rest, becomes habitual. Then any motion, whether induced or initiated, produces superior effects.

Three graphic divisions or fields of operation in physical therapeutics, which often overlap and supplement each other, are:

1. The object of constructive therapy is to enhance the powers of an individual who is presumably normal, of any age, but below par and designed to raise the coefficient of efficiency in structures through improved nutrition and performance of function, for one in whom there are constitutional or energy inadequacies, adynamias, often aggravated by poor nutrition in infancy, by neglect, disuse, misuse or abuse of endowments, shown by impaired heat making or heat regulating mechanisms, defective motor tone or other malfunctioning. Remedies include regulation of diet and body habits, also conscious control of grouped or associated structures as of the neck, the shoulder girdle, thoracic, truncal or pelvic girdle, and their reciprocal relationships.

Also harmonizing of the reflex circuits and neuromuscular mechanisms where there are found commotions in the tone of structures of the contained viscera, which need repositioning and completion of the action and excursus of organs which are out of normal adjustment through developmental faults or neglect, e. g., pulmonary structures, diaphragm (the thoracic and pelvic), readapting altered states of tone in major or gross structures, also in the bodies of the organs, hollow or tubular, e. g., the respiratory, digestive, cardiovascular, genitourinary, and of the intraabdominal pressures.

2. Reconstructive: The subject being of any age but in whom anomalies of structure or tone have been acquired, over or undertone or abnormalities in sustained tone or balance due to effects of injury, or disease, or after operation, or due to metabolic or other causes, leading to deformation, decrepitude or inequalities; to afford release from limitations, from contractures, adhesions, as in partial paralysis, whether of central causation or due to injury, undue compressions, or to interferences in any way. The main objective is to prevent deformity and to stimulate movement. The barometer of permissible movement is always pain.

Getting rid of offending parts or useless or harmful tissues, local areas which require modifications or removal, or for readaptation of supplemental or accessory parts when they have been removed and where there is need, and by reinforcement, substitution, compensation, or where local support or fixation is needed until the parts are able to again perform full function in accord with design.

Among the means often required are readaptations of the creature to new and favorable environment, as of climate, temperature range, elevated or level ground, mountains or seashore, of special dryness or moisture and the like. The effects of the sun, of graduated exposure, socalled nature cures, heliotherapy; and of contrasts of heat and cold. Also thorough cleansing measures, outside and inside, release from collections of toxic wastes, e. g., colon irrigation and restitution of organs in situation and tone. Many of these conditions are similar in their nature and aims to those in class 1, requiring developmental assistance and a return of parts to positions of advantage in order to regain opportunities for functional competence and harmonious interaction.

3. Remediative: The application of modalities of dynamic or available forces, graduation of powerful exogenous energies, such as thermotherapy, heat and cold, or alternations of heat and cold, contrasts of warmth or coolness, through the media of water or air, e. g., balneotherapy, hydrotherapy, hydrology, superheated air, of sun rays, heliotherapy, etc.

These include corrective manipulations, induced movements applied to gross structures, limbs, joints, viscera, especially to the back, that being the site of many reflex effects of disorders, of effects of irritations, infections, not only of septic foci capable of radical removal by surgical measures, but also of their obstinate and recalcitrant aftereffects. Also traction, pressure, counterpressure, support, fixation, immobilization, etc., to be followed at once by voluntary movements of the impaired muscles.

4. Composite, grouped, or systematized, therapeutics, including spa treatments, "Kurs," sanitarium methods, "rest cure," various associated or mutually supplemental measures, one designed to reinforce the other as recognized to be of proved efficacy in overcoming obstinate, recalcitrant conditions, maladjustments, deformations, decrepitudes, of both body and emotions which have become reduced to states of cellular or structural confusions, retardations, deteriorations in selfguiding mechanisms.

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The Quinine Test in Hyperthyroidism: Second Report

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The use of tests in the diagnosis of hyperthyroidism is both laudable and otherwise. While laboratory tests are a valuable addition to diagnostic methods, they not uncommonly mislead in the final analysis of the case. The more apparently dependable the test, the more will a number of busy practitioners be prone to minimize the value of their own clinical experiences, permitting their senses to become obtunded. Laboratory tests serve their highest purpose when employed as supplements to the diagnosis deducted from the conscientious use of the senses of the experienced clinician. Thus a test may confirm diagnosis. It is especially in hyperthyroidism that tests *per se* should be taken with a grain of salt, for the diagnosis of thyroid hyperfunction is perhaps the most elusive in the practice of medicine, depending largely upon the experience of the clinician.

The real confirmative value of a diagnostic test in hyperthyroidism (the same may be said of almost any diagnostic test) depends upon how small is the percentage of error associated with the performance of the test. Of the twenty or more tests described in diagnosis of hyperthyroidism, the most commonly employed are the Goetsch adrenalin test and the basal metabolism test. We are able, at this time, to state that neither is devoid of a considerable percentage of error.

THE ADRENALIN TEST.

The value of the Goetsch test depends upon two facts: first, the hypersensitiveness of the subject to hypodermic injections of adrenalin; and, secondly, an increase of symptoms in positive subjects. Hypersensitiveness to adrenalin injections is seen in a percentage of normal persons, in subjects of effort syndrome, organic heart disease, convalescence from acute infections, and in a large number of other conditions. This has been the experience of others (1 and 2) as well as my own. Moreover, though in most instances of thyroid hyperactivity the test proves positive, it is negative in a percentage of undoubted cases of this affection. But aside from the large margin of error of the adrenalin test in the diagnosis of hyperthyroidism, it must be stated that any test which depends for its results upon the whipping up of symptoms is inconsistent with the best interests of the patient.

BASAL METABOLISM TEST.

Basal metabolism observation indicates the degree above normal of catabolism going on in the body. Though the occurrence of a distinct plus reading is fairly constant in thyroid hyperactivity, there are many other conditions, eminently pituitary disease, diabetes mellitus, nephritis, myocarditis, chronic intoxications, the fevers, and even some subjects apparently normal, in which a high plus basal metabolism is observed. There is still a greater source of error in basal metabolism observation, namely the lack of expert technicians. Jones (3), in a recent article, has cleared the vision of those interested in this work. He concludes that there are three widely different sources of error in calorimetric determinations: 1, the test subject, though in normal health, may have a metabolic rate varying several degrees, and who may cooperate irregularly or not at all in the performance of the test; 2, the technician, who must execute many details and observations besides those pertaining directly to the manipulation of the instrument, and, 3, the apparatus itself, which may introduce error, perhaps consistent, perhaps variable, because of its mechanical defects unknown to the operator. In 1920, Jones, while testing his own apparatus, made comparisons of its results with those of apparatus of other makes in nearby hospitals and laboratories, and it was then that he discovered the most noteworthy, not to say startling, errors committed in metabolic determinations. For example, in a normal test subject, the metabolic rate was seen to vary from minus 17 to plus 90, through various errors, all of which were discovered to be classifiable in the above mentioned groups. On subsequent occasions Jones found this deplorable state of affairs to exist throughout all parts of the country, and aptly states that "any technician who feels that his own results are an exception to this, should see to his own technic in securing normal readings on known normal subjects before offering challenge to the proposition." On over a hundred different occasions Jones witnessed the beginning technic of over a hundred clinicians or their technicians. Not one of them, during their first attempts, came anywhere near the proper handling of the apparatus or of the subject during the period of testing, and it is a constant wonder to him that suits for malpractice are not the rule rather than the exception through the abuse of this most valuable diagnostic aid. For example, on one occasion the technician reported a plus 8 per cent. reading on a suspected hyperthyroid patient. The subject was dismissed as a neuropath. Four months later the physician, convinced that some error in the test had been made, ordered the technician to make a second test. This time the reading was plus 58 per cent. Soon it was discovered that because of a reading of three minutes and fifty-two seconds, the rate as determined previously should have been reported as plus 35 per cent. instead of plus 8 per cent. Now, however, the patient was so much worse that radical operation performed two weeks later eventuated fatally. On another occasion Jones observed a patient nearly asphyxiated during the course of the test because a tank of gas supposedly oxygen but containing nitrous oxide was used. Furthermore, the patient's viewpoint must also be taken into account. I have observed in a male subject of exophthalmic goitre a loss of five pounds in weight during a three days' stay at the hospital for metabolic tests, the patient remarking: "The cure is worse than the disease." I have found basal metabolic observations of comparatively little use in diagnosis. Its real function in this disease is to check up results of treatment. Just as the thermometer tells us that the course of a fever is at an end and the patient is convalescent, so basal metabolic observations when properly taken inform us that the excessive burning down processes in the patient's tissues have calmed down and metabolism is stabilized, and that the patient is on the road to recovery.

THE QUININE TEST.

In a previous communication (4) I reported my deductions from a study of 160 cases in which the relative immunity in subjects of hyperthyroidism to cinchonism was the principle of a test designated the quinine test in the diagnosis of thyroid hyperactivity. It was emphasized that subjects of thyrotoxemia are exceptionally tolerant to the physiological effects of quinine during the course of the disease and for a long time after recovery, and that this tolerance practically amounts to an immunity. Though no ample reason was advanced to explain this phenomenon, it was suggested that possibly the thyroid toxin in the blood exerts a neutralizing or modifying influence on the quinine, depriving the latter of the potentialities for producing cinchonism; the body having attained an immunity to quinine during the period of its administraton in the course of the disease, still retains this immunity for an indefinite period of time following recovery. A person taking forty grains of quinine daily with impunity is not necessarily suffering with hyperthyroidism, but proves to be relatively immune to quinine. As previously implied, the value of any test depends upon how small a percentage of error must be charged up against it. The percentage of error in the performance of the quinine test depends upon the number of people met with who are not suffering with hyperthyroidism but who are just as insusceptible to cinchonism. This percentage is much smaller than that met with in the performance of the Goetsch test (subjects of adrenalin hypersensitiveness not suffering with hyperthyroidism), and to be conservative, is at least as small as that of the metabolic observations in the diagnosis of this affection (subjects of high basal metabolism not suffering with hyperthyroidism). Very rarely do we meet with normal persons who can take more than ten or twenty grains of quinine without symptoms. The peculiar tolerance to quinine by sufferers from malaria and from such febrile conditions as pneumonia, the acute tonsillar diseases and other infectious processes, must not be construed as a state of natural immunity from the effects of the drug, but as a temporarily altered condition of the bodily reactions, to return to normal on the recovery of the patient. These instances of tolerance are, of course, easily determined and need not detract from the reliability of the quinine test in hyperthyroidism.

The technic of the test is simple, and, as implied, depends upon the immunity of subjects of hyperactive thyroid to the untoward effects of quinine administered in moderately large doses. The patient is given a dozen capsules, each containing ten grains of the hydrobromide of quinine, with instructions to take one capsule four times a day, to be washed down by an ample quantity of lukewarm water, an hour or two after meals and at bedtime. By the time thirty, forty, or fifty grains have been taken by persons whose thyroid function is not excessive, there develops a sense of fullness in the head, impaired hearing with tinnitus, often dizziness and headache, and occasionally a feeling of slight gastric and bladder discomfort. Persons possessing a degree of susceptibility or idiosyncrasy will experience these symptoms after the first or second capsule; while those to a degree tolerant may not complain until sixty to one hundred grains have been taken. In the presence of a hyperactive thyroid, no symptoms develop from the daily administration of quinine hydrobromide even if given during a period of weeks or months; on the contrary, improvement in the syndrome is frequently observed. In these patients, though gastric disturbances may constitute an element in the primary complaints, the administration of this dosage is apt only occasionally to aggravate slightly the gastric condition. If combined with proper gastric sedatives, however, this objection is overcome.

The hydrobromide is employed because it is the most acceptable of all the quinine salts and may be handled in larger doses without producing extreme discomfort in a patient whose thyroid gland does not functionate excessively. Also, the effects of this drug in negative patients wear off more promptly than with other forms of quinine. In the series of cases mentioned, none of the untoward symptoms experienced by nonhyperthyroid patients persisted beyond several days after the discontinuance of the drug. After my first report numerous opinions were brought to my attention on the use of the quinine test of which the following are noteworthy: Sainton and Schulman (5), of Paris, basing their study upon ten cases, conclude that the test is inconclusive and should be accepted with reservations. It must be remarked, however, that no test can be regarded as conclusive without reservations on the strength of observations limited to ten cases.

Pfahler (6), of Philadelphia, has employed the test both on controls and patients, and reports his observations as follows: "The quinine-hydrobromide test, recommended by Dr. Bram, seems to have considerable value, and I believe can be used without harm. I have used it in some instances in which the diagnosis was undoubted, and in some cases in which the diagnosis was doubtful. The test seemed to give me satisfactory results. I first tried the test on myself and my associates, and then used it on patients. . . . In the normal person there will be a pronounced cinchonism after the administration of from two to six or eight doses, but the hyperthyroid patient can take this continuously for weeks."

Since my primary report on this test in 1920, I have employed it in an additional three hundred cases, with a number of controls. I have been able amply to confirm its virtues as an asset in the diagnosis of hyperthyroidism, and have found it not only associated with a comparatively small percentage of error (approximately seven per cent.) but practically devoid of harmful effects in positive subjects.

The quinine test, when positive, confirms the diagnosis of hyperthyroidism, but does not distinguish between toxic adenoma and Graves's disease. The test is of marked value in differentiating hyperthyroidism from the following, in each of which the test is negative:

1. Simple or nontoxic goitre (with or without psychical tachycardia).

2. Mechanical goitre heart; a state of heart hurry and disturbance due not to thyroid intoxication, but to mechanical cardiac embarrassment because of pressure from an intrathoracic goitre.
3. Incipient pulmonary tuberculosis.
4. Neurasthenia, hysteria, nervous indigestion.
5. Paroxysmal tachycardia.
6. Effort syndrome.
7. Diabetes mellitus.

There are a few other conditions occasionally confused with hyperthyroidism, in which the test may be employed with advantage. Finally, the quinine test is highly serviceable in arriving at a diagnosis in those instances of Graves's disease in which both goitre and exophthalmos are absent. In such patients a positive quinine test may be regarded as conclusive.

CONCLUSIONS.

The quinine test in the diagnosis of hyperthyroidism is associated with a negligible percentage of error; it is inexpensive; expertness in its performance is unnecessary; it is harmless to the patient; and in positive subjects it usually results in some symptomatic relief.

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1431 SPRUCE STREET.

Typhoid Fever*

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INTRODUCTION.

In presenting this subject, I want, first, to direct your attention to typhoid fever as a vanishing disease, since in this manner one can best emphasize that progress in medical science with references to infectious disease, which has been responsible for our modern conceptions and practices in sanitation, with all of their farreaching benefits. Sanitation under war conditions has always presented a greater problem than it has under civil conditions in times of peace. The influence of sanitation upon the incidence of infectious diseases may be studied very advantageously in the records of armies engaged in the various wars of the past century. During the Mexican War, 1846-47, twenty-two per cent. of the American regular troops died of disease, fourteen per cent. were invalidated from disease, while only five per cent. were killed in battle, or died from wounds. During the Civil War, for each man killed in battle, two died of disease. In the Franco-Prussian War, 1870-71, the French mortality from disease vastly exceeded that from battle; while the Germans lost, in round numbers, seventeen thousand in battle and fifteen thousand from disease, the first conspicuous exception to the rule that, in war more men die from disease than from gunshot wounds.

In the Spanish-American War the records show 293 deaths in battle and 3,681 from disease, a ratio of one in battle to 12.5 from disease—the worst record for any war in which our country has engaged.

Most of you can well remember the nature of the disease responsible for this black record. The most fatal were typhoid fever for the volunteer camps in the United States; malaria and dysentery for the Philippine expedition; and malaria and yellow fever for the Santiago expedition. The board appointed to investigate the typhoid fever epidemic of the military camps in the United States in 1898, threw instructive light upon the subject. In 106 regiments, according to this expert board, hardly one half of the cases of typhoid fever were diagnosed as such because the disease presented many mild and atypical forms; so that the rate of admission, which was reported as 88.55 per thousand strength, should have been 192.65. Their conclusions were that the disease was largely fly-borne, as the swarms of these pests alternated in their feeding places between the latrines and the unscreened mess tents.

During the World War from April, 1917, to November, 1919, in our forces comprising about four million men, there were 1,056 cases of typhoid fever and 156 deaths from the disease. Sanitary conditions in the instance of the men in the trenches were about as bad as one cares to imagine, hence the protection from preventive inoculation contributed enormously to the favorable record. The experience in the recent epidemic at Salem, Ohio, shows that our discharged soldiers are protected by typhoid vaccination for at least two or three years (1). Thus in the Spanish-American War, one typhoid death occurred among every seventy-one soldiers; in 1917 one typhoid death for each 7,143 civilians; and during the World War there was one typhoid death for each 26,641 American soldiers. The ninth annual report of typhoid in the large cities of the United States, published in March, 1921, shows that in fifty-seven cities, the combined populations of which represent about one fourth of our country's total population, the total number of deaths from typhoid has decreased from 4,114 in 1910 to 921 in 1920, i. e., the death rate per hundred thousand has decreased from 19.59 in 1910 to 3.52 in 1920. This report includes only cities with a population of more than a hundred thousand and does not reflect typhoid conditions in those places in which we are most interested, namely smaller cities, towns and country districts. It is pertinent to observe, however, that from 1906 to 1910 the average death per hundred thousand in twelve cities with populations of over five hundred thousand each was 25.64, while that of ten cities of one hundred thousand class was 25.34; for the same classes of cities in 1920 the rates were 3.1 and 4.76 per hundred thousand respectively. This would seem to indicate that the smaller cities are not lagging far behind in the effectiveness of their antityphoid measures.

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*From the Bacteriological Laboratory of the Philadelphia General Hospital. Address before the Convention of the Fifth Censorial District, Pennsylvania State Medical Society, Caledonia, Pa., September, 1921.

ETIOLOGY.

A definite conception of the infectiousness and the transmission of typhoid fever from case to case was formed as early as 1856, by Budd, but it was not until 1880 that Eberth discovered in the spleen and mesenteric glands of typhoid patients coming to autopsy a bacillus, which we now know as the typhoid bacillus. Three years later Gaffky succeeded in obtaining it in pure culture. I will not go into a discussion of this bacillus, except such characters of it as directly concern us in studying the transmission of the disease. The bacillus is passed in vast numbers in the feces of patients, and also in the urine and sputum at times. It may be cultured from the rose spots. Outside the body boiling temperature kills it quickly, but freezing does not. Direct sunlight and desiccation kill it more tardily. In soil it may be live and multiply for long periods. In distilled water it may live as long as two or three months. In sewage, contaminated water, and in the feces, it tends to die out rather than multiply, because it cannot withstand the competition of the stronger growing saprophytic bacilli, especially the colon bacillus. Milk is an especially good culture medium for it. Outside the body it maintains its virulence, so that it remains ever ready to set up infection on gaining access to the body.

PATHOGENESIS.

Entrance to the body is gained almost always by way of the mouth. It is capable of withstanding passage through the stomach, and finds lodgment in the lymphoid structures of the intestines. Thence it is readily taken up into the lymph and blood channels. Its points of predilection, in addition to the lymphoid structures of the intestine, are the mesenteric lymph nodes, the gallbladder, the spleen, and later, with general septicema, the rose spots of the skin. The first four of these are usually spoken of as the sites of primary lesions of the disease. The local lesions in the intestines do not differ greatly in their progressive and healing processes from those of a localized pus infection of the skin, for example, a furuncle. There is hyperemia, edema, pressure necrosis, sloughing with ulcer formation; and later, in healing, the cicatrization in the subepithelial layers and the growing over of the epithelium. A fundamental difference is, that in the intestine, due to peristalsis and the erosion of the intestinal contents, the slough may be separated prematurely when bleeding results. Also the healing is slower because conditions of rest and cleanliness of the base of the ulcer cannot be maintained.

I will not go into the pathology in detail, nor will I discuss the symptomatology except to touch briefly on the anatomical and physiological bases of the symptoms. It is obvious that the general symptoms are much more pronounced than would be expected on the basis of the anatomical lesions in the gastro-intestinal tract. We might expect increased peristalsis, interference with the absorption of water from the large intestine, and a condition of diarrhea from the inflammatory lesions of the bowel, as occurs in amebic dysentery, for example, but not necessarily the high temperature, and the toxemia. On the contrary, the gravest cases show, at one time or another, a tendency to intestinal stasis with meteorism, which conditions indeed parallel, in their troublesomeness, the gravity of the general condition, and have come to be explained on the basis of the extreme toxemia.

What is the source of this toxemia? Does it represent abnormal absorption through the ulcerated intestinal wall? Is an inherent toxin of the infecting organism itself responsible, or is it due to an abnormal product formed by natural processes within the body directed in an unusual manner against the infecting germ, or concerned in the riddance of the tissue killed by the bacterial activity? The first may be answered in the negative by reference to cases of typhoid without intestinal lesions but yet with toxemia. The second is a factor, for it is well recognized that the typhoid bacillus contains an endotoxin. This toxin of the bacillus itself is perhaps the principal cause of the toxemia. The bacilli are destroyed in the blood stream and as their protein undergoes digestion, this endotoxin is liberated, while at the same time toxic split protein products are formed. In regard to the third question raised there is the possibility also that similar toxic split protein products may arise from the parenteral digestion of body cells killed by the activities of the infecting organism. We may regard then the toxic products of the bacillis as primarily responsible for this toxemia, and toxic protein products as secondary adjuncts.

The effects of the toxins are manifested clinically chiefly in symptoms referable to the nervous, circulatory, and the digestive systems. Thus referable to the nervous system, we have the headache, apathy, delirium, neuritis, general lack of tone in both skeletal and visceral muscles, and interference with the temperature regulating mechanism; in the circulatory system, the relative bradycardia and myocardial weakness, vasodilatation, the leucopenia and the anemia; and in the digestive system, profound disturbances in the production and in the activities of the enzymes concerned in the digestion of food, and interference with its assimilation, manifested in the anorexia, vomiting, etc.

According to our present views the fever represents a manifestation of the struggle between the infecting bacteria and their toxins, and the protective agencies of the host. The increased temperature is indicative for the most part of the increased oxidation processes attending the abnormal catabolism, as well as of the disturbances in the temperature regulating mechanism.

Obviously such local manifestations as intestinal hemorrhage, enlarged spleen, colycystitis, the rose spots, and other symptoms, are directly due the bacteria as they proliferate in the primary sites of infection, or are transported to other sites by means of the blood stream. Such complications as thrombophlebitis, chronic colycystitis with gallstone formation, otitis, periostitis, and others are referable to this same dissemination of the bacteria by the blood. Others such as bronchial pneumonia, pleuritis, pericarditis, nephritis and cystitis may be either due to the typhoid bacillus, or, in part, to other bacteria that have seized the opportunity of attacking a host debilitated by the primary infection; while such a sequella as furunculosis is due solely to the secondary invaders. The residual effects of the toxins are seen in the sequellæ —neuritis, nonsuppurative arthritis, posttyphoid psychosis, melancholia, and feeblemindedness.

The frank case of typhoid fever is recognized almost at a glance by the experienced physician. It is the younger physician of today who seeks the laboratory in the diagnosis of such cases. He has not seen typhoid. On the other hand I have seen older and experienced physicians puzzle over atypical cases in which they could do no more than suspect typhoid, and suggest other conditions which might be present, until a blood culture proved positive for typhoid.

I would not have you understand me to imply that laboratory work is not a useful adjunct in the diagnosis of typhoid fever, for it is that, and furthermore some laboratory work on typhoid patients is a necessity if as physicians we would render the best service to the community. The physician's duty does not end when he gets the patient "out of danger" but only when he complies with our present established methods to indicate that the patient himself is not a source of danger to others. I refer, of course, to determining when the patient ceases to excrete typhoid bacilli. Health boards require that three cultures of the urine and feces be negative for B. typhosus before discharging the patient. It is better to overdo than to underdo this.

The only laboratory finding which is conclusive proof that the patient has typhoid fever is the finding of Bacillus typhosus in a culture of the patient's blood. In well over ninety per cent. of patients during the first week of illness this may be obtained. The percentage decreases later since the blood tends to rid itself of the bacteria. Next in importance, diagnostically, is the culture of the feces. Even with the most heavily infected stool, it is estimated that the ratio of Bacillus typhosus to the other bacteria in the stool is as one to one hundred, so that differential media and an experienced bacteriologist are requisites in such a diagnostic procedure. Even so, repeated cultures are advisable before negative evidence becomes of much value. This is especially necessary in attempts to identify carriers, where the numbers of the bacilli excreted are relatively few. A positive stool culture identifies the patient as an active case, or as a carrier. Cultures of the urine are next in importance. These, of course, do not become positive until after the organisms have entered the blood stream, although they may continue positive after the blood stream has cleared up, due to a more tardily healing specific inflammatory focus within the genitourinary tract.

The Widal reaction ceases to be of use as a reliable diagnostic finding, since antityphoid vaccination has been practiced so extensively. The inoculation alone produces this reaction which may persist for months, and after disappearing for a time, it may again become demonstrable during the occurrence of any febrile attack. By determining the greatest dilution of a serum which will still produce agglutination of typhoid bacilli, we have a method of greater diagnostic importance. This is known as the macroscopic agglutination test, performed in small test tubes, and standardized by Dreyer—often called the Dreyer method. In typhoid fever these agglutinins may be demonstrated in the blood in about thirty-five per cent. of patients during the first week; in the second week in about eighty per cent.; and up to four weeks in from ninety-five to ninety-nine per cent. of cases. By repeated determinations of the concentration of these agglutinins in the serum of the patient during the course of the illness, they are observed to rise during the second and third weeks to high levels; whereas the agglutinins present in the blood from previous typhoid inoculation will rise only moderately with any febrile attack, other than typhoid. Thus by plotting out the curves we may arrive at a fairly reliable differential diagnosis. This method is also applicable to the paratyphoids, and in their differential diagnosis from typhoid. It was used extensively in the study of trench fever and other fevers in France as a means of ruling out typhoid and paratyphoid infections.

I should like also to emphasize the importance of blood counts. Typhoid fever gives a leucopenia from the onset. Differential leucocyte counts are less helpful, although there is a relative increase in the lymphocytes. A febrile disease with leucopenia limits the presumptive diagnosis to about four or five conditions.

PROPHYLAXIS.

The measures for the prevention of the disease may be divided into three main groups:

1. General measures directed to the protection of the entire community.
2. Special individual measures, by means of which the transmission of typhoid fever to those who come in contact with the patient is prevented.
3. Preventive inoculation, by means of which an attempt is made to render the person inoculated immune to the disease.

Before taking up the details of the methods for accomplishing prophylaxis, it will be well to summarize the principles underlying the measures to be cited. The development and the manifestations of typhoid fever are dependent on lesions in the human organism resulting from the invasion and the multiplication of the Bacillus typhosus. The growth and development of the typhoid bacillus naturally takes place in the body of the typhoid patient, and artificially in certain foodstuffs (e. g., milk) contaminated with excreta of individuals harboring the bacillus. The germs are thrown off in the feces and urine of the active case or of the carrier. It enters by the mouth of the next person in which it sets up the disease, no cycle of development in an intermediate host being necessary. The organism may live for months under proper conditions outside the body of man, a fact of importance in consideration of the immediate transmission of the disease. The principal disseminator of the germ is water. Others are milk, shellfish, green vegetables, fruit and flies.

The susceptibility to typhoid is universal, the disease being observed in all civilized countries of the earth. Young persons and adolescents principally are predisposed to the disease. Children under one year are rarely attacked, while after the fortieth year the frequency decreases. Recovery from one attack usually furnishes protection from subsequent attacks, although second attacks occur. The majority of cases occur in late summer and autumn.

GENERAL MEASURES OF PROPHYLAXIS.

Bearing in mind the above considerations, there appear two places of attack. First, adequately taking care of all the bacilli which leave the body with the excreta; and secondly, adequately protecting all things taken by the mouth from contamination with the germ. If the first could be carried out perfectly, there would be no need for measures aimed at the fulfillment of the second. Likewise if the second could be fulfilled perfectly, we might neglect the first, and still typhoid would become an unknown disease. Since neither can be done perfectly, we must aim to do both with as much perfection as possible, and herein lies the only hope of limiting the otherwise widespread dissemination of typhoid bacilli. A third possibility for blotting out typhoid remains, namely, that of rendering every person immune to infection with the organism, however widespread its dissemination may have been allowed to become. Under the latter state of affairs, typhoid bacilli would mean nothing more than does the colon bacillus under present circumstances. But this condition again can only partially be fulfilled in the prophylactic inoculation against the disease.

The difficulties with accomplishing the destruction of all the typhoid germs leaving the body lies not so much in the active clinical case of typhoid fever, but in the mild, missed cases of the disease, and in the problem of identifying and controlling the temporary and the permanent carriers of the bacilli. During the actual febrile period of the disease the excreta can be disinfected and disposed of with comparative safety so far as contact dissemination is concerned. The problem with the active case is to determine when during convalescence typhoid germs cease to be excreted, and to keep up the precautionary measures, provided it so happens that the recovered patient continues as a temporary, or more dangerous still, as a permanent carrier. Cultures of the urine and feces furnish a means of determining these points, but unfortunately cultural diagnosis is not generally available and even with it, patients are, no doubt, at times discharged, who subsequently may excrete the bacilli for varying lengths of time. Many of these carriers go unrecognized until a local epidemic of typhoid fever is traced back, only to find one of them working in a dairy, or at some occupation involving the handling and distribution of foodstuffs. In this way, year after year, we have brought to our attention very forcibly the fact, that every individual harboring typhoid bacilli is a real source of danger to the community, in that at any time he is likely to be the focal point from which arises an epidemic of the disease. The less he is suspected to harbor the organisms, the greater becomes the danger, for then precaution is thrown to the winds.

The carrier is then the greatest danger in the typhoid situation; next is the unrecognized case of typhoid; and lastly, least dangerous, is the recognized case of the disease.

Attempts at the fulfillment of our second hypothetical condition—that of preventing all things taken into the mouth from being contaminated with typhoid bearing material—involve all our modern methods of sanitation, which I need not go into in detail. Conditions in the cities, towns, and even in the villages have improved wonderfully, so that drinking water and sewage are for the most part kept separated, and so that each is so treated with chemicals, or otherwise, that it is rendered free from dangerous pathogenic bacteria. Water epidemics are growing fewer in the urban centres. In the country local outbreaks occur, and there are always some cases, undoubtedly of water origin, among vacationists returning to the cities each autumn. Dairy products, green vegetables and fruits may be contaminated from water sources, but more often through being handled by typhoid carriers, or by means of flies. The practice of the U. S. Army of having all food handlers studied by means of bacteriological examinations of the urine and feces for the detection of carriers is to be highly commended and is deserving of a more general application in civil life. According to a report of the British Committee investigating the spread of typhoid only fifteen per cent. of the cases were attributable to flies.

VACCINES IN PROPHYLAXIS.

Of all the countries engaged in the World War, Germany alone is not convinced of the efficacy of vaccines as a means of prevention of diseases of the typhoid group. For the most part the Germans used a vaccine killed by heating to 60° C., and there is no doubt that the efficacy of a vaccine is much lowered by exposure to this temperature. Later they improved their vaccines by heating only to 52 to 55°. Good results were obtained also with chloroform killed cultures. The French introduced the lipovaccines, in which the killed and dried bacteria were suspended in oil. This vaccine was also prepared in our army laboratories, and was used to some extent. It never became the authorized vaccine of the army, and its preparation has since been discontinued. It perhaps does not give quite as great a degree of protection as the saline vaccine. Its chief advantage from the army viewpoint was the single dose. Other features are, the attenuation of the toxic effects on account of the delayed absorption, and perhaps also through a partial neutralization of the toxins by the oil.

SPECIAL INDIVIDUAL MEASURES IN PROPHYLAXIS.

1. The only infective agent consists in the typhoid bacilli developing within the patient and extruded especially with the stools and urine. Contact with the patient is dangerous only insofar as there is danger of ingesting such infectious material. It, therefore, follows that patients are to be so taken care of and their discharges to be so treated that they shall not be a source of injury to others.

To overcome the dangers of contact infection, remove patients as far as possible from crowded dwellings, or from surroundings which do not permit of their proper isolation. Wherever possible patients should be sent to the hospital. If treatment at home is necessary, provision for nurses and attendants sufficiently informed in regard to the character of the infection and appreciative of its mode of transmission and prevention, should be made. All others are to be kept away from the patient.

In arranging the sick room, all unnecessary articles should be removed, especially rough woolen articles, carpets, and upholstered furniture. The room should be screened and kept free from flies.

Dejections from the patient are best received in porcelain bed pans and before being thrown into the watercloset thorough disinfection should be practiced. Chloride of lime is efficient for this purpose and is recommended because it is inexpensive and also is easy to apply. The solid may be dusted in the bottom of the bedpan before use and about a quart of a mixture of six ounces per gallon of water should be used to cover each stool, when the vessel may be covered and allowed to stand for one hour before emptying. Thorough cleansing and rinsing of the pans should be effected regularly, preferably with lysol solution. The same rigid disinfection of the urine, wash water and also remnants of food should be practiced. Sputum may more conveniently be received in paper receptacles and burned. Bed linen, body linen, etc., should be immersed in a five per cent. lysol solution before being turned over to the laundress. For the hands of the attendant a solution of one to one thousand mercury bichloride may be used. During the illness a solution of lysol in water should be used for washing floors and woodwork.

Preventive inoculation, while it should not be neglected until the appearance of typhoid, may yet well be employed in guarding others against the infection, always bearing in mind that little can be expected in the way of protection within the first two weeks after inoculation. It is here that a single injection of the lipoid vaccine may provide earlier protection than the more extended triple inoculations with the saline vaccine. The question of the socalled "negative phase" following the injections must be considered in applying preventive inoculation, so that persons with any abnormal temperature would not receive it.

TREATMENT.

Nursing is a most important factor in the treatment of typhoid fever and the physician is responsible for providing efficiency in this particular.

Perhaps the greatest advance made in the treatment of typhoid has been that pertaining to the dietetic management. Those of you who have observed typhoid patients in the days when they were starved, as well as dehydrated, will readily agree that no one single innovation in the treatment of the disease has been so conducive to the patient's comfort and well-being as that attending the introduction of the present day practices of feeding throughout the course of the illness. The principles involved in the adequate nourishment of typhoid patients are very definitely established. The protracted febrile condition requires increased food energy supply to meet the abnormally high amount of heat energy lost. Failure to supply adequate food energy to meet this loss of heat energy involves, first, the utilization of the supply of stored food energy of the body, chiefly the reserve carbohydrate and fat, but subsequently the formed body protein substances are broken down and utilized by means of the increased catabolic processes attending the febrile state. It is most important to shield the body proteins against this destruction.

The precarious local condition of the intestine, the digestive disturbances attending the toxemia, and the protracted febrile course constitute the main difficulties in applying these principles of adequate nourishment to the individual patient with typhoid. We must aim to overcome these difficulties by supplying food of high caloric value in an easily digestible and readily assimilable form. Carbohydrates, fats, and gelatinous substances meet these requirements when supplied in liquid or semisolid form. They should be given in small amounts and frequently, every two or three hours, day and night in the severe cases.

Milk deserves first mention among the actual articles of food since it supplies all the elementary food substances in a readily digestible form. Carbohydrates in the form of starchy and mucilagenous soups are very useful. Mashed potatoes well buttered or covered with meat juices are usually well received. Egg albumin water flavored with fruit juices or wines is to be highly recommended. The use of edible dried ox-blood or serum, rendered palatable and acceptable in a variety of simple preparations deserves a more general application in this country in nourishing acutely ill patients. Certain artificial foods may be especially useful at times. Alcohol serves both as a stimulant and as a source of readily available energy and may be used to great advantage in typhoid. The best drink is good cool water and it should be supplied to meet the patient's desires. Fruit juices may in part supply the fluid need, but a given flavor is likely to become distasteful very quickly, so that the flavors should be varied frequently, and they should never be urged upon the patient.

The appetite begins to return while there is still need for great caution in the choice of foods that may be allowed. It is very easy to meet the calory needs of the patient by increasing his allowances but it is more difficult to meet his craving for bulk to overcome the feeling of emptyness.

ANTIPYRETIC MEASURES IN TREATMENT.

The present conception of fever is that it is a manifestation of a useful defensive reaction on the part of the patient combating an infection, and that the increased metabolic processes attending the febrile condition may be a means of releasing the antibacterial defences more rapidly than they would otherwise be released. The wholly rational method of assisting nature in this process would reside in measures which would be efficient in ridding the patient of the infecting bacteria, or, failing in this, to provide for the neutralization of the toxins of the bacterial infection. With typhoid fever we are unable to accomplish either of these. There remains then the expedient of trying to promote the elimination of the toxins while at the same time so caring for the patient that he will always be in the best possible condition to combat the infection through his natural defences. Continued and excessively high temperatures interfere with the patient's rest, bring on exhaustion, and throw a greater load on the cardiac and respiratory mechanisms. Symptoms of restlessness, delirium, exhaustion, cardiac weakness, and respiratory embarrassment should be the indications for the employment of measures aimed at lowering temperature rather than a temperature reading above a certain degree as indicated on the thermometer.

Hydrotherapy is the most efficient form of antipyretic treatment. Water may be employed in a number of ways. Full baths at one time used extensively are being less used at present because they are cumbersome of application and since in typhoid fever the desired effects can usually be obtained by tepid or cold sponging. Accessory to these the icebag may be used to the head in cases with marked stupor and delirium. When the pulse frequency is high, some employ a small icebag over the heart.

Antipyretic drugs have little use in typhoid. They may be in full doses markedly depressent. The manifestation of this effect may tend to quiet the patient, but the end effects can scarcely be regarded as beneficial to the patient. On the other hand, with hydrotherapy, the same quieting effects on the central nervous system are accompanied by improvement of the pulse and respiration, while at the same time we have provided an efficient method to promote elimination through the skin.

I need not go into the symptomatic treatment referable to the individual organs or systems. In handling that dreaded complication, intestinal hemorrhage, there is nothing new to offer. The principles are to overcome the attendant restlessness at once with the free use of morphine, and later in case of alarming collapse to institute treatment for shock. It is well always to bear in mind that a moderate degree of collapse is nature's last resort in controlling hemorrhage so that it is not well to combat this unless very alarming cardiac weakness follows an unusually severe hemorrhage. An icebag or cold Leiter's coils are used over the abdomen, presumably with good effects. Styptics administered by mouth are naturally useless. Calcium chloride by mouth to increase the coagulability of the blood, because of slow absorption, acts too tardily to control the acute hemorrhage, but finds use where there has been manifested a tendency to bleed. More is to be expected from the intravenous administration of calcium chloride (up to five c. c. of a five per cent. solution). Administered in this way it has an opiumlike effect in allaying peristalsis and intestinal irritability, while at the same time the effect in promoting coagulation of the blood is obtained at once. Subcutaneous injections, or intermuscular injections of normal horse serum have come into much favor in combating a tendency to hemorrhage.

SPECIFIC TREATMENT OF TYPHOID.

The use of specific serums has never gained much favor on account of their doubtful therapeutic results. Vaccines have been employed extensively, first, indeed, as early as 1893 by Frankel. Frankel's favorable reports with specific vaccines in treating typhoid fever were followed almost immediately by the reports of Rumpf, who obtained good results with a vaccine composed of the Bacillus pyocyaneus. In these two instances we have the beginnings of the use of specific and of nonspecific vaccine therapy in typhoid. Following Wright's work in 1902, vaccines have come into vogue. Ichikawa in 1915 revolutionized the method of employing vaccines in treatment of acute infections, when he introduced the intravenous method of administration. He treated twenty-one typhoid patients with typhoid vaccines intravenously. Two died as the result of uncontrollable hemorrhages from the nose. Of the remaining nineteen, seventeen made immediate recoveries as far as temperature and toxic symptoms were concerned, one had a recurrence with bronchopneumonia and died, and one had a recurrence which subsided immediately after a second dose of vaccine. Gay reports that sixty-six per cent. of the patients with typhoid treated by him with intravenous vaccine were favorably influenced.

NONSPECIFIC PROTEIN TREATMENT.

Since these reports, our ideas of the specific nature of these effects have been overturned, for equally encouraging results have been obtained from a variety of nonspecific, or, socalled, foreign protein substances. Various nonspecific vaccines, peptone, secondary proteoses, deteroalbumose, milk, foreign serum, etc., are among the many substances which have been used and the remarkable thing about it all is that similar effects are produced by all. Colloidal metals have also been shown to produce like effects.

Favorable results with these methods of intravenous therapy are so prompt and striking as to be almost unbelievable. Following the injection, there is a chill lasting from fifteen to forty-five minutes, a rise of temperature which subsides to normal, or subnormal, in twelve to eighteen hours, following which the fever simply fails to return and the signs of the toxemia have disappeared, the patient appearing not unlike a malaria patient between chills. In typhoid it is conservative to say that about one fifth of the patients respond in this manner, while in a fifth more the disease terminates by short lysis.

This form of treatment is still regarded as heroic and is not to be generally advised. Its likelihood of increasing the tendency to hemorrhage alone makes it unsafe in typhoid patients. It would certainly never be employed in cases which had shown hemorrhages. It should not be employed in extremely weakened and debilitated patients, or in patients in whom the cardiac condition is such that no reserve energy is available to tide them over the period of the chill and increased temperature.

The manner of action of these substances cannot be accounted for by principles of which we at present have a definite understanding.

Theoretical explanations are: Selective stimulation of the hematopoietic organs which are believed to be the source of antibodies. High temperature is unfavorable to the establishing of an infection and perhaps to its continuance. Leucocytosis—increased phagocytosis. Mobilization of ferments—which may aid in rendering bacterial toxins nontoxic. Antiferments which have been shown to hinder bacterial growth in some instances. Physical changes in the serum. Antigen and antibody coexist; may release antibody.

The most recent development in the way of biological agents lies in the finding of a substance in the filtrates of the stools of convalescent typhoid patients which has the power of dissolving typhoid bacilli. A portion of the filtrate from stools is said to dissolve an entire broth culture of the bacteria and this dissolved culture in turn possesses the same property. In this manner, this bacteriophage, as it is called, can be carried along indefinitely. Reports are beginning to appear now on employing this substance in therapy, but no definite methods have been developed.

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1932 SPRUCE STREET.

Physiological Effects of Static and High Frequency Currents

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In the application of electricity to the human body for the relief of various constitutional and local pathological conditions, our aim is to produce certain definite physiological responses, such as muscular contractions, removal or venous sedation of motor and sensory nerve fibres. The armamentarium required for this is quite an extensive one. It should include:

1. A large modern Holtz machine.
2. A wall plate from which is to be had the galvanic, faradic and sinusoidal current.
3. A suitable transformer for high frequency currents and for diathermy.
4. An x ray apparatus.
5. Devices for light and heat applications. A mercury vapor quartz light, or an arc light apparatus, of which the Hofman infra Ultra Rays generator is an example.
6. A vibrator.

We have placed the static machine at the head of the list for the following reasons: 1, It is the oldest electrotherapeutic apparatus. 2. The expert finds it the most flexible means of producing certain reactions.

The oldest and to this day one of the most efficient means at our command of producing a sudden perturbation in a part, together with a transitory anemia which is quickly followed by arterial hyperemia, is the static spark.

To administer this we place our patient on the insulated platform. The sliding rods are widely separated. The shepherd's crook is hooked on to the positive sliding rod, the negative side is grounded. The machine is now started. The patient is thus charged with positive electricity, the walls and sides of the room with negative electricity. A metallic ball electrode is grounded by a chain to a separate ground. With a sudden approach of this ball sparks, long or short, are withdrawn from the part to be treated. At the moment a spark strikes the patient's body, under these conditions, there is produced a sudden equilibrium of the patient's and the earth's potential. In other words, we effect a very sudden discharge of the accumulated static charge.

The result of this is evident to the observer. The sudden incidence of the spark to the bare skin of a patient produces a sharp, incisive, scarcely painful blow, a contraction of the muscles, marked spots of anemia, cutis anserina. This is quickly followed by hyperemia. In nervous persons the suddeness of the spark is apt to cause so much psychic effect as to lead the uninitiated to think that the painfulness of the procedure is great. The contrary is easily proved. Sparks are, however, painful when applied to bony protuberances.

The effects just described make sparks a valuable aid in the removal of infiltrations, the relief of muscular spasm, and the promotion of nutritional interchanges. In place of this method I have used, with satisfaction to myself and patients, a resonator discharge from a static machine for more than twenty years. This resonator consists of an inverted Tesla coil, to one end of which is attached a solenoid for the purpose of increasing the wave length.

The d'Arsonval (the primary) and the Tesla (the secondary) are insulated by very heavy insulation. This consists of a tube of mica and heavy fibre; gallon size Leyden jars are connected by the inside to the static machine, while their outside is connected to the primary of the coil. This arrangement is known as the de Kraft resonator. We have in this apparatus a means of increasing or diminishing the length of the spark at the exploders between the Leyden jars. This gives us also a means of regulating the length of the effluve, from a very short one of considerable warmth to one of great length and coolness. If the powerful static machine is run slowly the individual pulsations will recur slowly. The greater the rapidity of the machine the more rapidly the Leyden jars fill and the greater the frequency of the impulses of the pulsations. They may be made so great that no muscular response is elicited. All of the local and constitutional effects of static sparks, as previously described, may be obtained herewith to any desirable degree; and in addition we have a means of procuring rhythmical muscular contractions of any part of the body. The bipolar method is the one usually practised. A metal plate is attached to the Tesla and placed over the abdomen or back directly over the bare skin. The effluve electrode is attached to the solenoid and is moved more or less rapidly over the part to be treated.

Passing from the static spark to the static brush discharge our step may be more or less abrupt. To diminish the abruptness we must use, instead of a metallic electrode, some medium which offers resistance to the abruptness with which we endeavor to equalize the patient's and the earth's potential. A wooden stick electrode, made of maple or white wood, which is capable of absorbing moisture, is the best means of obtaining the short, hot, peppery discharges known as the sputtering brush discharge. These consist in reality of very fine sparks. Their impact causes a sensation as if hot sand were thrown onto the skin. The effect on old ulcers is very stimulating. The ozone and nitrous oxide, which are evolved during the administration, effect a glazing over of ulcers which may act as a protective covering. Friction sparks obtained by rubbing a ball electrode very rapidly over the surface of the body (preferably over the clothing of the person) have a very warming, revulsive-hyperemic effect and serve to relieve pain by reason of the decongesting and numbing effect on hypersensitive nerve endings. The resistance of the clothing and of the dry skin, which offers an almost impenetrable wall to these extremely short sparks of relatively low potential, serves us well by breaking the abruptness of the equalization of potential.

To secure the maximum physiological effect of the blue pencil brush discharge, it is necessary to have a large static machine of twenty revolving plates operating at a maximum of efficiency. To obtain this we have the sliding rods widely separated. The patient is connected to the negative side of the machine, the positive side is grounded, the electrode (de Kraft blue pencil electrode) being grounded to separate ground.

This electrode consists of a wooden shell in which asbestos is packed. It serves as a means of adding resistance to the static current, making possible a very long blue spray which is soft and unirritating. This spray consists of thousands upon thousands of fine sparks. It is very luminous and possesses to a high degree the property of ionizing the air between the electrode's metal point and the patient's skin. The blue pencil spray has pain relieving and general sedative properties of a very high order. It also produces hyperemia of the part to which it is applied.

The constitutional effects produced by it may be summarized as follows: It enhances the oxidation processes of the body as a whole. There is produced a marked sense of coolness. It has a marked stimulating effect which has been compared by some patients to that of champagne. Applied for its strictly local effects to an acutely inflamed joint, the relief from pain is often almost instantaneous. We have seen patients, who had been tortured with pain for several days, fall sound asleep within five minutes after the beginning of its application. We have seen the discoloration of a joint, the result of subcutaneous effusion of blood, the result of trauma, subside in a most surprising manner. It relieves muscular spasm more quickly than any other physical agent.

The static wave current is simply another means of utilizing the physical properties of the spark. The patient, being seated, on the insulated platform, is connected to the positive side of the static machine by means of a suitable wire to which is attached a metal electrode. The negative side is grounded. With the machine running at a suitable speed a series of sparks are allowed to pass, by opening up a gap between the balls of the sliding rods. The longer these sparks the greater the potential of the current delivered to the patient. For administering this modality to a part of the patient's body, we use sheet metal electrodes of a size and shape suitable to the condition we wish to treat. These are placed in direct contact with the bare skin. For applications to the cavities of the body, such as the rectum, prostate, uterus, suitable electrodes are utilized.

By means of this arrangement we have it in our power to charge and discharge the person on the insulated platform with impulses recurring rapidly or slowly. The density of the entering charge is governed by the size of the metallic electrode and the potential delivered. The greater the density of the current and the greater the potential the more pronounced will be the tissue contracting effect of this spark discharge.

This tissue contracting effect is of considerable use in those conditions where we wish to change the vascular tone of a part. Proper regulation of the spark discharge at the sliding rods enables us to effect in a high degree tissue drainage and relief of spasm. Too high a rate of spark discharge does not give the tissues time to recover from the stimulation. It induces fatigue. With the more moderate rate of spark discharge we aim to get periods of alternate contraction and relaxation. In this way we may improve the general metabolism and produce a marked tonic effect on the entire body.

Jenks and Clarke have shown in their Report to the American Electrotherapeutic Society in 1904 that an ordinary static machine of that period was capable of charging a condenser to eight hundred amperes and over. All of the methods we have spoken of depend for their physical effects upon the wonderful power of accumulation of static electricity, upon its ability to produce capacity discharges because of its ability to fill condensers. It is because of this that we get deeply penetrating physiologic response.

If we attach a Leyden jar to each of the prime conductors of a static machine and have the sliding rods slightly apart, the machine running at fair speed, we note the rapid passage of sparks at the sliding rods. A pair of electrodes attached to the outer coatings and held the same length apart will also show a shower of sparks. This is the basic arrangement of all high frequency currents. It is called the static induced current. By means of this we may effect marked tissue contractions at a rate of frequency dependent upon the rapidity of the revolving plates of the machine. When the generating capacity of the machine is great, the Leyden jars small and the spark gap very short, no contractions will be produced, but we may procure a numbing effect on the sensory nerve endings. There is also produced a marked desiccating influence which may be made use of in inflammatory conditions.

To illustrate: About twenty years ago a patient came to me with a badly swollen middle finger. This was the result of a slight wound made by a sharp instrument. The skin was hot and the pain was excruciating. The static induced current was applied by means of a pair of small sponge covered electrodes (the size of a fifty cent piece). The spark gap was extremely short and the machine was running about three hundred revolutions a minute. In five minutes the pain was gone. In ten minutes the part was soft and cool. Two years later the part was so soft that it seemed as if pus had formed. We cut into it and to our surprise found a hollow, empty space. This wound healed quickly and no further trouble developed.

D'Arsonval in 1890 conceived the idea of interposing between the outer coating of the Leyden jars a copper spiral. For charging the Leyden jars he employed a coil of large capacity. With this arrangement he made his famous experiments. Gradual improvements in apparatus have led up to our present type of transformer by means of which we are enabled to use oscillating currents of practically continuous duration in medical and surgical practice. Diathermy is the name which Nagelschmidt proposed in 1909 for this type of high frequency currents. This is now the general designation. Thermopenetration, which was the name first used by von Zeyneck, and the designation of endothermy of Delherem and Saquerriere, is now rarely employed.

These rapidly oscillating currents have placed in our hands a means of introducing electrical currents into the tissues in sufficient volume, to effect demontrable heating of the blood and of the entire body. All electrical currents possess the property of warming conductors through which they pass. Unidirectional currents cause an electrolytic dissociation, by a migratory process in the body tissues, together with a displacement of minute particles of the body's colloids; in fluids there is a wandering process of the contained salts.

The body is composed of billions of cells, each one of which is surrounded by a partially permeable membrane at which, under the action of currents of extremely high frequency and low voltage, there is a concentration which seems to have an important bearing on the development and storage of heat. The same phenomena occur during the employment of currents of low enough frequency. But as the rate of alternation increases the migration of the ions diminishes because the rapidly shifting alternation of the current impulse does not allow time enough for the resolution of molecular fixation. Instead of electrolytic dissociation, we have an extremely rapid molecular vibration which is the cause of the heat production by diathermic currents. It is probable that anabolic and katabolic changes are induced or accelerated and the oxydation processes improved. Clinical observations and the results of urinary examinations emphatically confirm this view of the matter.

The continuous and the alternating currents of low frequency can not be used in sufficient strength to produce thermometric demonstratable heating because, even in relatively small quantity, they produce painful neuromuscular and electrolytic effects. In larger quantity they produce extensive destruction of tissue and death. Mild heat imparted to the yeast cell increases its activity twenty-five per cent. and the observation of the beneficial effects of warmth on many forms of plant and animal life may lead us to assume that the introduction of warmth into the cells of the body will add to their activity, and that the diathermic heat stored up in millions upon millions of cells tends to conserve their natural resources and add to their surplus of reserve energy. After a general warming of the musculature of the body, muscular effort becomes easier, greater and more sustained effort is possible, and mental processes are also aroused to a better activity.

By means of suitable metal electrodes, we have it in our power to concentrate the diathermic heat upon any given area, we can also direct the path of the current and control its depth of penetration by proper position of the electrodes. We will observe after such a current has had sufficient time to warm a part an increase in the capillary circulation, and an increased production of sweat and sebum under and immediately around the electrodes. When heavy currents are employed this increased production of sweat is often very profuse, and it may at times be so hot as to blister the adjacent skin.

Patients find this warmth very agreeable. It is introduced from without in immediately utilizable form, without the expenditure of any of the patient's stored energy. The warming is different from that obtained by any other artificial method. It occurs from within, in the interior of the body, in which every single cell participates. Centres of heat are formed in millions of cells. This heat is only slowly dissipated. The deeper the seat of the cell, the more slowly it loses the stored-up heat. An addition of heat beyond the normal stimulates, by a reflex effect, all those functions which favor the emanation of heat. The capillaries of the skin become widely dilated, much of the blood thus drawn to the surface is taken from the splanchnic circle.

The heat passes off by the skin. This is influenced by the temperature of the surrounding air, by the amount of body covering (clothing) and by the degree of distention of the capillaries of the skin and mucous membranes. The temperature of the surface of the body is lower than that of the blood. An extensive peripheral hyperemia makes possible greater heat losses. The watery emanation from skin and mucous membranes of the air passages, the increased secretion of sweat enhances the dissipation of watery vapor. The increased rapidity of the respiratory excursions increases the activity possible by the mucous membranes. This automatic regulation of the body enables us to tolerate an addition of heat up to a definite point without changing our temperature. A strictly local application to a joint will not markedly effect the general heat capacity of the body. Large electrodes and larger currents and longer duration of the seance exercise all the powers of defense which we have detailed. Beyond a certain point a rise of the temperature of the blood of the entire body is inevitable. A relatively small amount of diathermic current, applied to a little animal like the guineapig, will raise the temperature of its body to the point where paralysis of the heat regulating apparatus of the body occurs.

The reason for this is simple. The acceleration of the blood stream at the point of contact of the electrodes is greatly intensified in a relatively short time, depending entirely on the strength and concentration of the current, and the entire volume of blood in the animal is heated to the danger point. An agent such as this which is capable of producing such widely distributed heat effects, necessarily influences the activity of the sympathetic and autonomous nervous systems.

There is no organ so deeply seated that it cannot be reached by the diathermic heat. All gland secretion can be greatly augmented by diathermy. The functions of the sweat glands, of the liver, the pancreas, the gonads, the thyroid, the kidneys, the stomach, all of the endocrines may be stimulated. By suitable application of the electrodes, proper doses and duration, we have it in our power to induce an active arterial hyperemia anywhere. The degree to which such an active arterial hyperemia may be of benefit to the patient is dependent upon the nature of the pathological condition.

It would be very unwise to apply a heavy current to an arteriosclerotic limb. The influx of an excessive quantity of arterial blood would overtax the venous system of the part greatly. The result of this would be an intensification of the pain from which the patient is suffering as well as other disagreeable consequences.

An excessive quantity of current for too long a time to a cirrhotic liver will result in an increase of accumulation of fluid in the peritoneal cavity. A safe rule to follow, if our aim be to increase functional activity of an organ or a part, is to use mild current strength of somewhat long duration.

If we wish to affect deeply seated organs like the stomach we will achieve our object more quickly with milder currents of longer duration than with heavy currents of too great concentration. The latter rouse the reflexes quickly, and a rapid afflux of blood to the part occurs which carries away a large part of the diathermic heat. In this way, the diathermic heat is hindered greatly in reaching the interior of the stomach.

It is for this reason that we frequently achieve beneficial effects with milder currents applied from different points at the outside of the body (a cross fire effect) better than with large electrodes and heavy currents.

Diathermic currents have marked analgesic properties. This analgesic effect is due to the great rapidity of the oscillations, to the desiccating influence, to the marked arterial hyperemia which it induces, and to the decongesting influence which it is capable of exerting in proper doses by relieving venous engorgement. By reason of this marked arterial hyperemia we may expect to soften scar tissue. The injection of the capillaries in scar tissue with a greater abundance of arterial blood improves the nutrition and thereby changes a lowly organized structure into one of a higher order of viability. This is evidence enough that arterial improvement in scar tissue, improvement in capillaries does take place in scar tissue and warrants us in its use. The diathermic heat has also a marked influence in retarding and destroying bacterial life in invaded structures. There appears also to be a destructive action on bacterial toxine manifested.

Indigocarmine as a Functional Permeability Test of the Liver*

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Ever since the duodenal tube has given us the opportunity of a direct examination of the bile, it was natural to apply the same methods of exploration of the liver function as those applied for the kidneys. The bile being elaborated and excreted by the liver is in many respects analogous to the urine excreted by the kidneys.

Abel and Rowntree, Hurwitz and Bloomfield (1) have used tetrachlorphenolphthalein as a permeability test of the functional activity of the liver. This substance was given by the authors intravenously and the stool collected for twenty-four hours and examined with regard to the amount of phenolphthalein in the stool. In cases of liver disturbances the excretion of phenolphthalein through the bile and found in the stool was appreciably diminished.

Aaron, Beck, McNeil and Schneider (2) have improved this tetrachlorphenolphthalein method by testing the bile as it appears through the duodenal tube, by aspiration every few minutes and making the determination of phenolphthalein content in the fluid. This is certainly a great advantage over the original Abel and Rowntree method. A great drawback, however, of this method consists in the necessity of applying the tetrachlorphenolphthalein intravenously and in this way detracts from its general usefulness as a clinical method.

Indigocarmine, methylene blue and other colors have first been used experimentally on animals with biliary fistulas and later on on patients for ascertaining the permeability of the liver to these various colors.

Weil and Cecil (3), Brauer (4), and Buerker (5), were pioneers in these researches. Hatiéganu (6) was the first to apply indigocarmine in a systematic way for the testing of the liver function. He gave the indigocarmine intramuscularly and examined the bile every few minutes by duodenal aspiration. Similarly methylene blue was used by Rosenthal and Falkenhausen (7) and congo red by Lepehne (8) as a functional test for the liver. We fully agree with Hatiéganu that indigocarmine is by far the best of these dyes for our purposes, for its recognition in the bile is established much easier than other dyes.

In the present article we intend to present our experiences with indigocarmine as a convenient test for liver function. At first we tried to give this substance in suppositories by rectum or by using injections into the rectum of solutions of this substance. Both ways, however, failed utterly, as they did not appear in the bile. Then we tried the intramuscular method as suggested by Hatiéganu. Ten c. c. of a ne per cent. solution of indigocarmine proved to be ne correct amount for general use. It is selfunderstood that the injection has to be given with due septic precautions. We gave injections always in ne fasting condition of the patient, aspirated the bile efore injection and then every five minutes after the njection, and noted the first appearance of the dye the duodenal contents. We also paid attention to ne length of time that indigocarmine appeared in the ile, until its entire disappearance.

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*Read before the Americain Gastroenterological Association, May 1, 1923, at Atlantic City, N. J.

Date	Name	Diagnosis	Time after injection of indigocarmine of its first appearance in bile.	Time of disappearance of indigocarmine from bile.	First appearance of indigocarmine in urine.	Time of disappearance of indigocarmine from urine.	Amount of indigocarmine in urine.	Total amount of urine containing indigocarmine passed in cc.	Actual amount of indigocarmine passed in urine (in grams).
ov. 30, 1922	Dr. H.	gastroptosis	30 m.	5 h. 30 m.	45 m.	5 h. 30 m.	1:50,000	145	0.0029
ov. 10, 1922	M.	acute gastritis	30 m.	5 h. 10 m.	45 m.	2 h. 10 m.		65	
ov. 22, 1922	Gold	gastric ulcer	30 m.		30 m.	4 h.	1:40,000	125	0.0031
ec. 10, 1922	H.	gastric ulcer	40 m.	2 h. 5 m.	5 h. 5 m.		1:25,000	300	0.012
ec. 19, 1922	H.	gastric ulcer	1 h.	3 h.	1 h. 25 m.	9 h. 25 m.	1:15,000	600	0.04
eb. 20, 1923	N. M. J.	duodenal ulcer	30 m.	1 h. 20 m.				280 25% glucose solution before injection.	
ct. 27, 1922	Mrs. S.	gastric ulcer	30 m.	10 h. 30 m.	45 m.	15 h. 30 m.		75	
ın. 10, 1923	B.	duodenal ulcer	45 m.	2 h.	1 h.	5 h.	1:30,000	300	0.01
ec. 14, 1922	Schn.	duodenal ulcer	50 m.	3 h. 20 m.	35 m.	24 h. 30 m.	1:20,000	1100	0.055
ın. 22, 1923	Fr.	periduodenal adhesions	30 m.	5 h.	2 h. 15 m.	4 h. 15 m.	1:35,000	420	0.012
ar. 2, 1923	Mrs. Vc.	diabetes	1 h.						
ov. 17, 1922	Esk.	chronic myocarditis	1 h. 10 m.	3 h. 50 m.	30 m.	6 h. 50 m.			
ct. 31, 1922	Eo.	Raynaud's disease	1 h. 15 m.	2 h.	1 h.	5 h. 30 m.		85	
ın. 1, 1923	St.	catarrhal jaundice	No indigocarmine in bile during 3 hours.		1 h.	8 h. 45 m.	1:20,000	1300	0.065
ec. 23, 1922	Kay	cholecystitis	1 h. 15 m.	4 h.	1 h. 15 m.	10 h. 15 m.	1:18,000	1270	0.0698
eb. 7, 1923	Mar.	cholecystitis gastric ulcer	35 m.	1 h. 5 m.			1:10,000	600	0.06
ec. 16, 1922	Mark.	cancer liver jaundice	2 h.	2 h. 45 m.	24 h.				
ın. 3, 1923	Le.	cancer liver jaundice	No secretion of indigocarmine during 4 hours.						

In cases in which there was difficulty in obtaining ne duodenal contents after the injection of indigoarmine, a few c. c. of saline solution were injected rough the duodenal tube and syphoned out. This most instances effected a flow of bile. In only rare nstances other means were resorted to in order to stablish a flow of bile. In these we usually applied instillation of twenty-five per cent. glucose soluon into the duodenum. In all these patients where ne indigocarmine test was applied, the urine was kewise watched for the appearance of this substance nd the time of excretion noted, as well as the quanty of urine containing this dye.

It appeared to us worth while to ascertain the uantity of indigocarmine excreted by the urine and r this purpose we made colorimetric solutions of digocarmine and determined the amount of this ye in the urine. We found that in cases in which nere was a relatively small amount excreted by the ver, there was a correspondingly larger quantity covered in the urine.

We have embodied the results of our work with tigocarmine as a test for liver function in Table I. On looking over this table we find that the average ne of first appearanace of the indigocarmine in ses not afflicted with liver troubles is about forty inutes. In diseases of the liver, especially when companied by jaundice, it is usually delayed, most malignant trouble of the liver, in one case not pearing until two hours after injection and in nother case of cancer of the liver not appearing at l; in one case of catarrhal jaundice the indigocarmine did not appear in the bile at all, the period of observation lasting four hours. The injection of indigocarmine also produces a stimulation of the liver secretion, resulting in the production of a dark bile, previous to or after the appearance of the indigocarmine in the bile.

In a few cases we tried the indigocarmine and also Widal's (9) *crise hémoclasique* tests. The latter test, as is well known, consists in giving the patient in the fasting condition two hundred c. c. of milk and examining the blood for the number of leucocytes every twenty to thirty minutes for a period of an hour and a half. Normally there is always an increase of leucocytes during the period of digestion. In diseases of the liver, according to Widal, there is a decrease of leucocytes instead of an increase. In Table II we present in tabular form our experiences with Widal's test in a number of liver affections and other diseases. It can be easily seen that the functional test of the liver devised by Widal does not prove of great value. We have here four cases of cancer of the liver in all of which there is a decided increase in the number of leucocytes instead of a decrease.

TABLE II.

SHOWING RESULTS OBTAINED IN VARIOUS DISEASES BY USING WIDAL'S TEST (CRISE HEMOCLASIQUE).

		Leucocyte Counts Before and After Milk.			
Name	*Diagnosis*	*Fasting*	30 *min. after milk*	60 *min. after milk*	90 *min. after milk*
Mrs. H.	bronchial asthma	10000	11400	12100	11000
Mrs. H.	bronchial asthma	9300	11100	12200	9000
F.	bronchial asthma	12000	14000	14600	13800
Mrs. T.	endocarditis	9700	9900	10100	9000
Mrs. L.	anæmia perniciosa	5000	5400	5200	5400
K.	sciatica	9800	10000	10600	13100
H.	encephalitis	19000	19900	21200	20100
B.	diabetes mellitus	8200	9200	9600	9400
Mrs. Ho.	ptosis of stomach	6700	7100	7200	7400
H.	cancer of stomach	29000	33000	32300	26000
K.	cholecystitis	6200	7400	8000	7600
E.	cirrhosis of liver	8100	8800	8800	7400
O.	cancer of liver	28000	30000	34200	32000
Mrs. E.	cancer of liver	8800	9800	11200	8900
Mrs. E.	cancer of liver	9500	10600	11800	10300
Mrs. O.	cancer of liver	22000	23600	28100	25000

To Dr. I. Rogatz and Dr. M. Elias we are indebted for help in obtaining the specimens of bile and the blood counting.

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An Interesting Case of Laryngeal Stenosis*

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I wish to place on record a case of laryngeal stenosis of a type which seems not to have been given the attention which it deserves, and regarding which practically nothing may be found in the literature.

CASE.—The patient, a laborer about fifty years of age, was admitted on May 15, 1922, with the chief complaints of hoarseness, dyspnea, and a choking sensation in the throat. The onset had been acute, eight days before admission, with chill, fever, coughing and shortness of breath. Though there had been a slight improvement in the first two days of illness, on the third day the patient's condition suddenly grew worse, and, in addition to his previous complaints, he had pain in the neck and his sputum was bloodtinged. His previous history showed that he had been under treatment for lues several years previously, but the date of the infection was not recalled; otherwise it was negative. Upon admission the patient appeared seriously ill; was dyspneic, cyanosed, and practically aphonic. His temperature was 38.5° C.; his tongue was coated and the pharyngeal mucosa, reddened and granular; stomatitis was present, the type of which was not mentioned. External examination of the neck was negative. The chest showed dullness over right lung and increased fremitus; breathing was bronchial, most markedly over the middle lobe. The heart was negative; hypertension was present. Laryngoscopic examination revealed a laryngitis. The right cord was markedly infiltrated, especially in the posterior half. On May 20th, a subsidence of the process was noted, but the infiltration in the right cord was still present. An x ray of the lung was negative. The Wassermann reaction was four plus. The examination was otherwise negative.

The patient was placed on combined treatment for a period of approximately a month, but his condition remained unchanged. On June 13th, tracheotomy was performed, in order to relieve the increased dyspnea, after which the pulmonary signs cleared up promptly. Combined treatment was then resumed. About this time laryngoscopy showed a tumor bulging and displacing the right cord, covered by a smooth, healthy mucous membrane, and obstructing the glottis practically completely. The right arytenoid cartilage was immobile. Tissue removed for biopsy was returned with a diagnosis of normal mucous membrane. A tentative diagnosis of perichondritis was made.

On August 9, 1922, I performed a laryngofissure with the object of removing the affected cartilage. The tracheotomy wound was extended and the larynx fissured from below upward. In the right half of the larynx there was found a large, dense, sharply demarcated tumor, which displaced the true and the false cords, obliterated the sinus Morgagni and filled the larynx. The mucous membrane, over the tumor, was normal in appearance. Opposite the posterior pole of the tumor, there was developed markedly a structure which has recently been described by me.

This structure consists of a sinus on the inner laryngeal wall bordered by prominent lips, located beneath the true vocal cords, and below the cricoarytenoid joint. Underlying this sinus is a group of glands, drained by a common duct opening into the sinus. In the average normal case this structure is recognizable only as a thickening of the mucous membrane at the point mentioned, in the centre of which a depression may be noted. In many normal cases this structure assumes a marked prominence (Fig. 1).

Histological sections revealed the condition shown in Fig. 2, in which we note a sinus bordered by prominent lips, into which there opens a duct (in this case about two mm. in diameter), draining a group of glands lying between the mucosa and M. vocalis. The swellings constituted by the glands form the lips of the sinus. The gland may also extend upward into the vocal cord. It differs from the racemose salivary type of gland in its compound tubular structure, and in that the gland groups are composed of mixed mucous and salivary type of elements (Fig. 3), all of which apparently drain into a common duct. It might be mentioned, in passing, that Maziarski noted many years ago the peculiar compound tubular structure of some of the glands of the larynx. Although various groupings of the secretory glands in the larynx have been described, no mention has been found of a gland group identical in position and character of composition with the one here described, and similarly drained by a common duct.

The tumor found by me at operation in our case bore macroscopically the appearance of a pathological change in the structure mentioned above. The fissured cricoid and thyroid cartilages were found to be normal. Inasmuch as the mucosa over the tumor was absolutely intact, a submucous enucleation of the tumor was undertaken. The planes of cleavage were well defined, and the tumor readily shelled out. At the bottom of the wound there lay free the arytenoid cartilage. Because it showed signs of dry gangrene, to all appearances due to cutting off the blood supply by the tumor, it was removed. The vessels were ligated, the tracheal cannula replaced and the laryngeal wound packed and drained.

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*Read before the Laryngological Section of the Academy of Medicine, New York.

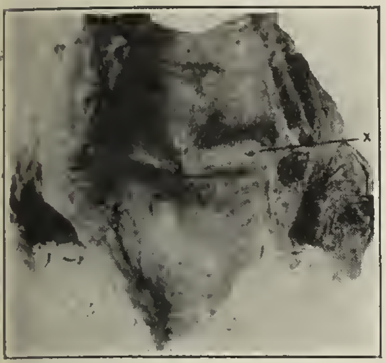

Fig. 1.—Larynx showing at (x) organ in question. (2) is a prominent well-developed laryngeal tonsil attached to the aryepiglottic fold.

The patient made an uneventful recovery, except the mild symptoms caused in the first few days after the operation by postoperative edema. When examination on October 8th revealed that the wound was completely closed, dilatation by means of the Thost bougies and Schrötter tubes was resorted to. The patient was now once again able to breathe comfortably through his larynx, which showed a fairly large and free glottic space.

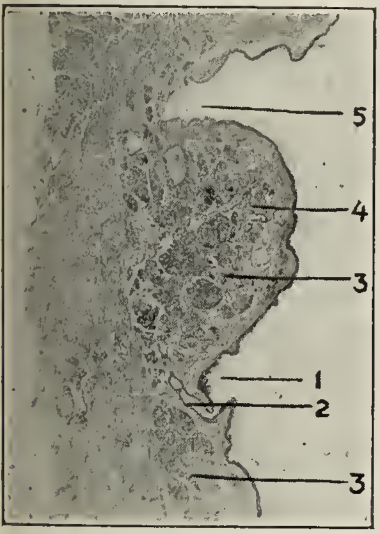

Fig. 2.—Cross-section of the structure illustrated at (x) in Fig. 1. (1) is sinus, (2) common duct draining glands (3). (4) vocal cord, (5) Sinus Morgagni.

The pathological specimens (Fig. 4) are of interest; the tumor (1) was about one and a half by one by one half sm. in size, dense and fibrous in consistency. The arytenoid cartilage (2) was grey in color and, though intact in form, showed a dry gangrene and was putrid. The dry gangrene which it had undergone was unquestionably due to the cutting off of its blood supply by the neighboring tumor; for had the process originated as a primary infection, hematogenous or otherwise, there would have been a loss in its substance.

Histological sections showed that the tumor substance consisted of scar tissue through which there were scattered areas of round cell infiltration. Giant cells or caseation were nowhere in evidence. The picture is that of a subacute or chronic inflammation healing gradually with scar formation. The nature of the inflamed structure is merely suggested by the ringlike scar bodies in the body of the tumor, but is rendered manifest by sections of the tissue at the periphery. These sections show that the scar bodies find their origin in an inflammatory process involving the glands described above, and show all stages of the process—the initial peritubular infiltration, the lysis of the gland's cells, the absorption of cell substance, and, finally, the replacement of tubules by scar tissue, which on cross section have the appearance of rings. The fibres of the M. vocalis immediately adjacent to the glands were also apparently secondarily involved. No bacteriological studies were made of this case.

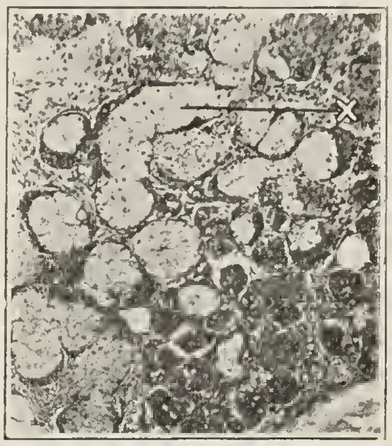

Fig. 3.—Glands (3) Fig. 2 magnified 100X. Tubular nature is seen at (x).

The question of differential diagnosis is in this case an interesting and difficult one. First, the possibility of an underlying tuberculous or luetic lesion as a basis for the condition must be considered; secondly, the question as to whether the chrondritis was primary or secondary. Acute inflammatory onset is not absolutely typical of either tuberculosis or tertiary lues. A tuberculous lesion or a gumma would have caseated and ulcerated through the mucous membrane before attaining the dimensions of the tumor. A gumma in the early stages would have rapidly responded to antiluetic treatment. The histopathological pictures rule out both possibilities; for, though there were nests of active inflammatory tissue interspersed in the scar tissue, there were no signs of tubercle or gumma formation. The matter of relative time of origin of the perichondritis seems to be settled by the fact that the perichondritis was in a stage of development earlier than that of the glandular lesion, as is evidenced by the absence of any signs of lysis of the cartilage substance, and the absence of pus about the necrotic cartilage, both pointing to a cutting off of blood supply by pressure of the tumor as the etiology of the necrosis of the arytenoid, and the glandular lesion as primary.

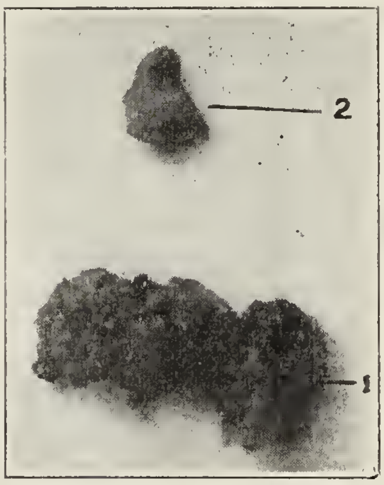

Fig. 4.—(1) Gland enucleated at operation from case here described. (2) Arytenoid cartilage, intact in form, found in a condition of dry necrosis, behind the tumor. The bulk of the tumor was so large as to cut off circulation of the cartilage.

PATHOLOGY.

The pathology of this case differentiates it from the general category of chronic submucous laryngitides, and indicates that it represents an undescribed clinical entity—a stenosis of the larynx caused by a subacute or chronic inflammation of a group of secreting glands of the larynx.

The case here presented is a laryngeal stenosis caused by a primary infection of a laryngeal structure, consisting principally of a group of secretory glands, secondarily conditioning a necrosis of the arytenoid cartilage. The onset was acute, febrile, associated with a stomatitis, and the infection initially acute, subsequently ran a chronic course. The stenosis in due time became so high grade that tracheotomy was necessary to relieve dyspnea. In view of the failure of palliative treatment, including iodides, mixed and salvarsan treatment, enucleation of the gland was necessitated. The gland was readily enucleated submucously.

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Septic Portal Thrombosis

With Report of Two Cases

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Septic portal thrombosis or pylephlebitis, although not a rare condition, is uncommon enough to warrant a brief résumé and a report of two cases.

Suppurative pylephlebitis (portal pyemia) is more common in males than in females. It is especially common in early adult life, coinciding with the age incidence of appendicitis, but it occurs at all ages, the average age in men being forty-four years and in women forty-one years (Ralston). The thrombosis may begin in the portal radicals within the liver, in the main trunk of the vein, or in the peripheral radicals anywhere within the area of the collection of the vein; and subsequently by extension the process may become widespread.

ETIOLOGY.

Usually the process begins in the peripheral radicals, being secondary to ulcerative and suppurative processes of the gastrointestinal tract. Of these the most common is ulcerative or suppurative appendicitis, more particularly in cases neglected surgically; or in which the infectious thromboses occur in the appendicular and mesenteric veins. Less commonly, ulcerative and neoplastic processes of the stomach and intestines, such as gastric and duodenal ulcer, typhoid fever, tuberculosis, amebic ulceration of the intestine, gastrointestinal carcinoma, fissures, ulcer and stricture of the rectum and anus, suppurative and gangrenous pancreatitis, suppuration of the mesenteric gland, suppurative disease of the female genitalia, and abscess of the spleen constitute the starting point of the infective thrombosis. The thrombosis occasionally begins in the main trunk of the vein, sometimes in consequence of operative trauma, but usually secondarily to a local focus of suppuration—perigastric periduodenal, subhepatic, or to gallstones in the common duct with surrounding suppuration.

PATHOLOGY.

The process may be more or less localized or quite widespread. The vein is enlarged, swollen, softened, congested, edematous, and is filled with a more or less necrotic purulent or sanguineous purulent material partially or completely obstructing the lumen. Not infrequently there is obvious purulent infiltration of the wall of the vein, (perivascular lymph spaces) and in the adjacent connective tissue, usually on the right side. When not entirely liquefied, the clot is more or less friable, occasionally free in the lumen, but usually it is more or less intimately attached to the intima. The liver is usually enlarged and contains foci of necrosis, or multiple abscesses; the spleen is enlarged and softened, not infrequently there is localized or generalized purulent peritonitis; there may be a purulent pleuritis, and sometimes secondary abscesses develop in different parts of the body.

SYMPTOMS.

Since suppurative pylephlebitis is a secondary disorder, the symptoms directly attributable to it are preceded by those of the disease to which it owes its origin, notably, appendicitis and cholelithiases. The onset of the pylephlebitis is usually sudden, and is manifested by the phenomena of septicopyemia—irregular chills, fever, and sweats, a soft, compressible rapid pulse, leucocytosis, and general prostration. To these may be added extension of the abdominal pain beyond the seat of the original disease, enlargement and tenderness of the liver, which occur in about fifty per cent of the cases, and enlargement of the spleen, which occurs in twenty-five per cent. of the cases. Vomiting occurs in forty per cent. of the cases (Rolleston). Diarrhea occurs in thirty-two per cent. and hematemesis in eighteen per cent. of the cases. Langdon Brown says that in sixty per cent. of the cases the onset is acute, that is, although the thrombosis may be a gradual process, symptoms due to complete obstruction develop suddenly. The most marked of these symptoms consist of ascites, enlargement of the spleen, and various disorders of the gastrointestinal tract. Rolleston says that ascites is present in sixty-five per cent. of the cases. Symptoms referable to various complications, such as pleurisy and brain abscess, may supervene.

DIAGNOSIS.

This rests upon an obvious primary cause, the development of a septicopyemic state, and evidences of the involvement of the liver, with perhaps slight jaundice. Differential diagnosis between Charcot's intermittent hepatic fever, other forms of liver abscess, other forms of septicopyemia, typhoid fever, and the chills and fever may simulate malaria.

PROGNOSIS.

The disease is fatal in a great majority of these cases, especially when the main trunk of the vein is involved, or when there are multiple abscesses in the liver. However, cases of recovery have been reported.

TREATMENT.

Pylephlebitis is more easily prevented than cured. Appendicitis and other etiological factors should be treated early, so as to prevent the formation of an infectious emboli. When developed the treatment of pylephlebitis is the same as a liver abscess. Ligation of the portal vein has been reported without avail.

CASE REPORTS.

CASE I.—Male adult, forty-three years of age, married, a truck driver, complained of pain in the right upper quadrant, with nausea and vomiting, jaundice, chills and fever, and ascites. His family history was practically negative with regard to the present condition. At the age of eighteen he had had typhoid fever, with no complications. He had had lobar pneumonia at the age of twenty-four and again at thirty-two. His present illness began seven days before admission, when he was seized with generalized pain in the epigastric and right hyperchondriac region. He vomited bile for two days, the pain finally becoming localized in the epigastric region, when the vomiting ceased. The following morning he had a chill, which lasted a half hour, followed by high temperature and later by profuse sweats. He noticed at this time a rapid enlargement of the abdomen, and he also became slightly jaundiced. The chills, fever, and sweats occurred the following day and the ascites and jaundice became more marked. He passed a small quantity of blood by rectum. He was taken to Bellevue Hospital, but the following morning was sent home to be treated by his family doctor. Because of the marked ascites the family physician introduced a trocar to relieve it. The following morning the patient was brought to the People's Hospital.

Physical examination showed an adult male who appeared acutely ill, with peritonitic facies, marked jaundice of the entire body, rapid and shallow respirations, and crying aloud with pain. The head was negative. The eyes showed pupils irregular, dilated, and reacted to accommodation but not to light. Extraocular movements were all right. Sclera and conjunctiva show marked icteroid tinge. The nose, mouth and ears were negative; also the chest and lungs. The pulse rate was 140 regular, and the heart sounds were fair; no murmurs. The abdomen was markedly distended. In the left lower quadrant a puncture wound, where the trocar had been inserted, was somewhat inflamed. There was exquisite tenderness in the epigastric and right hyperchondriac regions and marked rigidity of the entire upper abdomen. Fluid could be elicited with shifting dullness and a fluid wave. The liver reached three fingers below the costal margin; the spleen was not enlarged; the kidneys could not be felt, and Murphy's sign was negative. Rectal examination revealed nothing.

Laboratory findings: Temperature, 103°, pulse 140, respirations 28. Blood count; white blood cells, 28,600; polymorphonuclears, 89 per cent.; lymphocytes, 11 per cent. No malarial parasites were found. The urine showed a slight trace of albumin, but was otherwise negative. The stools showed no blood, although the patient said he had passed blood. Blood culture was negative. Blood pressure, 140/60. Wassermann, four plus.

In the hospital the patient continued to have chills and a temperature which went as high of 106°, with profuse sweats. The following morning he showed signs of a generalized peritonitis and passed away the same day.

Autopsy findings: Permission for autopsy was granted for abdominal examination only. The abdomen was found to be full of a serofibrinous fluid, with evidences of a generalized peritonitis probably caused by the introduction of infection with the trocar, as the line of entrance was markedly inflamed. In the gastrocolic omentum there was a large abscess cavity about the size of an orange. It was well incapsulated. The abscess cavity, as far as could be ascertained, had no connection with the transverse colon or stomach, but because of the close proxmity of the stomach to the abscess cavity, there was little doubt that the abscess was the result of a perforation of the stomach. The liver was large, swollen, red and congested. The liver was removed, and the portal vein was found to be occluded completely by a large septic thrombus. Frank pus was found in the portal vein and the liver on section showed miliary abscesses. The gallbladder, appendix, and rectum were negative, as was also the remainder of the gastrointestinal tract.

CASE II.—Female, aged thirty-eight, married. Her chief complaint was pain in right upper quadrant, nausea, vomiting, jaundice, chills and fever. Her family history was negative, and her past history was also negative, except that she had had recurrent attacks of gallstone colic in the last seven years. Her present illness began six days before admission, when she had had an attack of gallstone colic, for which she was given morphine as usual and the pain subsided. The following day she noticed that she was getting slightly jaundiced, and that evening she had a chill, followed by high fever and perspiration. On admission to the hospital, her temperature was 97°, pulse 130, respirations 24. That evening she had a chill and the temperature went up to 107°, with pulse 140, and the jaundice gradually increased.

Physical examination showed a patient who looked acutely ill, but apparently free from pain. Head, eyes, ears, nose, etc., were negative; chest, heart and lungs were normal. In the abdomen there was marked sensitiveness over the gallbladder with slight rigidity of the right upper quadrant. There was a marked yellowish color to the skin. The abdomen was flat. The liver could be felt at the costal margin. The spleen and kidneys were not palpable. No fluid could be elicited. Rectal and vaginal examinations were negative. The patient continued to have a chill every day with the temperature going as high as 107° and 108°, and increased jaundice.

Laboratory findings showed the blood pressure to be 120/70. The blood count was white blood cells, 4,600; polymorphonuclears, 88 per cent.; lymphocytes, 12 per cent. No malarial parasite was found. The urine was entirely negative.

The diagnosis rested between portal thrombosis and Charcot's hepatic fever from a stone at the ampulla of Vater, and operation was decided upon. The gallbladder was found to be full of stones and was removed. There was a stone in the common duct which was removed and the duct drained. The appendix was normal. After the operation the patient continued to have chills daily with high temperature and marked prostration. The blood count now was 22,000 white cells and 92 per cent polymorphonuclears. The patient continued to grow worse and died four days after operation.

Autopsy findings: The liver was removed through the old incisions and presented the following findings. The portal vein contained a large septic thrombus which included about three quarters of the lumen of the vein. The liver showed miliary abscesses.

CONCLUSIONS.

1. Pylephlebitis is secondary to disease of the gallbladder, appendix, or remainder of the gastrointestinal tract.

2. The condition is invariably fatal.

3. The symptoms are classical and there is little difficulty in making a diagnosis.

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Further Observations on Intussusception in Infants

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In presenting this brief paper on acute intussusception in infants, it is with the knowledge that much has been written on the subject; that in the main the disease has been fully described, and that the chief manifestations of the condition make its recognition easy to the careful clinician. I believe that no apology is necessary, however, in view of the fact that intussusception is a much commoner disease than is generally supposed, that there has been discovered something more of its pathology and mechanics, and that there is still room for improvement in the early recognition of intussusception and the submission of the patient to operation at an earlier period after the onset of symptoms.

It has been shown repeatedly that the mortality in children suffering from intussusception is in exact ratio to the number of hours elapsing between the onset of the symptoms and the time of operation and that the deaths in this condition are due almost solely to the degree of advancement of the pathological condition.

What actually happens, anatomically, in point of time, is this: One loop of bowel is swallowed by another and along with the swallowed loop there is taken in a certain amount of its mesentery and a mass is thereby formed. In this process the mesentery is kinked, its venous circulation is disturbed, the ingested loop is squeezed and it oozes blood and mucus; its lumen is constricted and with increasing edema becomes closed entirely. After a few hours the now congested and edematous loop loses its vitality through the strangulation of its arterial circulation and this intussuscepted section of the bowel dies.

And in point of time there is a perfect synchronism between the symptoms of the disease and the anatomical pathology. With the ingestion of the loop of bowel and the dragging on its mesentery there is the consequent abdominal shock, manifested by pallor; the pain and the reflex vomiting are due in large measure to the traction on the mesentery. Then comes the intermittent spasm as the bowel attempts, by powerful contraction, to rid itself of the obstruction. With the venous stasis in the intussuscepted loop comes the blood and mucus in the stool and in a longer or shorter period, depending on the severity of the condition, the closure of the bowel and the failure to pass stool or gas. For our purpose it is unnecessary to follow the picture to gangrene. As there is almost perfect agreement between the condition present and the symptoms manifested, it must be said at once that the degree of the pathological states and the degree of the symptoms are subject to wide variation.

In the main there are four types of intussusception that occur most commonly:

1. The ileocolic, in which a portion of the ileum is invaginated into the colon but the ileocecal valve remains fixed.

2. The ileocecal, in which the ileocecal valve acts as the starting point of the intussusception.

3. The enteric or ileoileal, in which one loop of small intestine is invaginated into another.

4. The colocolic, in which some portion of the colon is invaginated into a neighboring portion of the large bowel.

This classification is here repeated because it is necessary to the probable explanation of the cause of the disease. Of the previous explanations of the etiology none have been entirely satisfactory, and it remained for Perrin and Lindsey, basing their conclusions on the work of Walton, Fitzwilliams and D'Arcy Power, to advance what seems upon careful consideration a workable solution.

As something like seventy-five per cent. of all intussusceptions in infants occur between the fifth and ninth month, and approximately eighty-five per cent. of these are of the ileocolic and ileocecal types combined, any explanation of the etiology of the disease must take these two factors largely into account. D'Arcy Power has pointed out the fact that in infants the colon is little larger in diameter than the ileum and that the disproportion between the two in later life is the result of postnatal development. An examination of the ileocecal valve in the infant shows that it projects about half an inch into the colon, thus constituting a natural intussusception of the ileum into the colon. "In a child of three months the terminal inch of the mucosa of the ileum is studded with masses of lymphoid tissue which form a complete ring about the lumen of the gut; the aggregation of lymphoid tissue becomes less and less marked as the ileum is examined farther away from the valve until, at a point six inches above the valve, except for isolated Peyer's patches, there is no special aggregation to be found."

"At one year it is seen that the ileocecal valve is still prominent, but the patches of lymphoid tissue at the termination of the ileum, though well marked, is less developed." Thus it is shown that during the first year of life the lymphoid tissue in the ileocecal valve and the degree of projection of the valve into the cecum are at the maximum. Both are much less marked during the second year of life and the prominence of each gradually decreases as adult life is attained.

From the fifth to the ninth month of infancy additional articles of diet are given children, the intestinal digestion is disturbed, there is a swelling of the lymphoid tissue sufficient to permit this swollen mass to act as a foreign body, and in the attempt of the bowel to rid itself of this, the foreign mass is forced onward and is in turn swallowed by the next succeeding loop.

It is a common observation that intussusception occurs mainly in well nourished children and it is in precisely these cases that the lymphoid tissue is best developed. Most of the problems confronting us are hereby answered, the presence of the excessive lymphoid tissue occurring at the time and in the region of the greatest frequency of the disease. It might be added that isolated areas of lymphoid tissue in the colon and in the small bowel readily account for the occasional colocolic and enteric intussusception. Contrary to what might be suspected in enterocolitis the lymphoid tissue is atrophied and it is the general experience that intussusception is not prevalent in seasonal enterocolitis. The greater frequency of intussusception in male children still remains to be explained and it may be that the fact that "male babies are age for age larger and heavier than females and the lymphoid tissue of the gut varies directly with the size of the child" gives us the necessary clue.

This completes our clinical picture. A well nourished child, usually under two years of age, generally in our own cases breast fed, is seized with cramps, turns pale, vomits, perhaps has one or two stools without blood, and then passes blood and mucus by rectum, either with or without stool; perhaps a mass is felt by abdominal palpation and much less likely the examining finger in the rectum may feel the intussuscepted loop of bowel. But the classical case is rare, and waiting for the case to become classical may result in the patient's death. The history of intermittent attacks of screaming with evidence of severe pain, the vomiting, and the blood and mucus passed by rectum, with failure to pass stool and gas, should be sufficient to establish a diagnosis. In about fifty per cent. of the cases that I have seen an abdominal mass could be palpated; in the remaining fifty per cent. no mass was palpable, but its presence was proved by operation.

In a small percentage of the cases coming under observation, with typical histories of intussusception, the patients had apparently recovered and the intussusception been reduced at the time I saw them a few hours after the onset. Under continued observation no further symptoms developed. On the reduction of the intussusception the child's color returns, there is passage of a normal stool, the crying abates, and repeated feedings are retained. This phase of the question is of the utmost importance, as it is well known that children suffering from intussusception have periods of quiescence lasting several hours, and the distinction between this quiescent period in a child actually suffering from intussusception and one in whom the intussusception is relieved must be made with great clearness.

And now in contradistinction to what has been said, permit me to recall that the intussuscepted bowel need not necessarily be completely occluded, and that while the history of the case may be typical, the symptoms may vary widely in degree. In these cases the invaginated bowel may be only slightly constricted and congested, and may function for some days in spite of its altered position. The condition then becomes subacute and particular caution is necessary in order that the symptoms may not be overlooked or regarded too lightly.

As to the treatment it need scarcely be said that operation at the earliest possible moment offers the best chance of recovery. In cases diagnosticated within the first twenty-four hours, and operation performed promptly, there will be almost 100 per cent. of recovery. After the first twenty-four hours, as has been said, the mortality is that of the disease.

In a previous paper I reported all cases of intussusception admitted to Lebanon Hospital over a period of years. The number at that time was forty-six. I now wish to add twenty-five additional cases, of which six patients died, giving a mortality rate in the last series of approximately twenty-five per cent. Of these six patients not one was operated upon within eighteen hours of the onset of the symptoms. The time elapsed varied from twenty hours in one instance up to seventy-two hours in two of the cases.

Since July 1, 1922, I have seen seven patients in whom the diagnosis of probable intussuseption had been made. In four, operation was done, the intussusception found, and the invagination reduced. In two of the cases the history of intussusception was clear, but a careful analysis of the symptoms as they presented at the time I saw them, as related above, led me to believe that the intususception had been relieved. No operation was done in these. The seventh patient showed blood in the stool but a typical history of the condition was absent and examination of the point of the syringe used in giving the baby an enema, satisfied me that there had been some trauma. No operation. All of these seven patients recovered. In this series all of the patients were seen early in the disease, and when operation was indicated, this was done promptly. I have separated this year's cases in order to show that there has been a distinct improvement in the early diagnosis of this condition by the physicians.

The total number of the cases of intussusception occurring in this city is large, as evidenced by this report of seventy-one cases within a few years admitted to Lebanon Hospital. The number of cases occurring in an individual practice is generally small and that fact often accounts for the delay in diagnosis and treatment, as owing to its relative infrequency the diagnosis does not suggest itself.

Cancer of the Breast

*What Can the General Practitioner Do to Improve the Prognosis?**

By LEO B. MEYER, M.D., F.A.C.S.,
New York.

Eighty-six thousand deaths from cancer last year, eight thousand of which were due to cancer of the breast! Surely a mortality such as this should make us all keen to do everything possible to diminish it. The Society for the Prevention and Control of Cancer, as its share toward this end, holds meetings, mostly among the laity, at which the subject is discussed in a nontechnical way. This campaign of education, it is hoped, will result in patients consulting their physicians before extensive damage has been done, possibly before a positive diagnosis of cancer can be made. Much has been done but much still remains to be done. Patients do consult their physicians earlier than formerly for abnormalities of the breast; this is statistically proved in the practice of many surgeons by the greater proportion of nonmalignant growths removed today compared with former years. According to Bloodgood, more than half the breast tumors seen by him today are benign. I am sorry to say that this is not true in my practice. Over seventy-five per cent. of the breast tumors seen by me are malignant, the redeeming feature being that today I see many more in an early stage than was formerly the case. Women should know that breast tumors are often benign; this knowledge would relieve them of the fear that the discovery of a breast tumor dooms them, but they must learn that they cannot be the judges of the character of a growth. Immediate consultation with a physician is the price they must pay for their protection.

Some day, not far distant I hope, women will have learned that breast tumor means surgery just as acute appendicitis does. Their education will have advanced so far that they will know (what today every physician should know and explain to his patients) that only in this way can the development of cancer in the growth be forestalled, or if upon examination of the specimen the growth should prove to be malignant, the subsequent radical treatment in this early stage will increase the probability of permanent cure, in fact make of the probability almost a certainty.

At this stage, it seems to me, a little introspection might not be amiss. Are we quite sure that the patient with a precancerous lesion always gets the best advice when he consults us? What has become of that patient who consulted us a year or more ago with a small movable growth in the upper outer quadrant of the breast, almost in the anterior axillary fold, who was told that the condition amounted to nothing at all, nothing but a small gland or possibly a cyst or a little fibroma, and was advised to go home and forget about it? Possibly we gave her a placebo of some ointment or some potassium iodide internally, and salved our conscience by telling her to return if the growth ever bothered her; or, possibly, we did a little better and kept the patient under observation to see whether the growth would disappear under our treatment or show signs of changing its character. Did that patient remain well or did the growth change its character either under our observation or under the observation of the patient herself? If the character of the growth changed, the patient's chances of cure were certainly diminished by the delay; even if it did not change the advice was poor, for all of us, even the most skillful in diagnosis, must acknowledge that rarely can we be certain that malignancy has not started in an apparently innocent growth, and never can we be certain that the growth will not at some future date become malignant. This being so, how is it possible for us to refuse to advise our patients along the lines suggested by those who have had the greatest experience in dealing with breast tumors. Such advice should be that all breast tumors that are not frankly malignant are potentially so, and if occurring in a woman over twenty-five should be surgically treated.

I have said that the cancer propaganda has seemed to do much towards influencing women to consult their physicians earlier than formerly for trouble occurring in their breasts. This was very forcibly impressed upon me during the past year, when in the course of one week three patients were referred to me with a diagnosis of probable carcinoma of the breast. All of the women were positive that the growth was less than a week old (one had noticed it only the day before). This certainly was an encouraging state of affairs—women who consulted their family physicians immediately upon noticing something wrong with their breast instead of procrastinating for fear that they might be told a disagreeable truth, physicians who referred their patients to a surgeon promptly instead of placating them, or fooling themselves by the use of various medicaments internally and externally, or by simply watching the growth to see if it remained stationary or increased in size, or possibly waiting until a positive diagnosis could be made, although I am happy to say that this does not occur very frequently today. I said this was encouraging—and it was. But frankly there is another picture. Less than a month after this, a patient was referred by her physician who had previously telephoned to me that he was sending a patient with a growth in her breast that he had been watching for six months; he felt that the growth should come out to avoid future (?) trouble, though he did not consider it malignant then. He said he thought that it would be advisable to examine a frozen section of the growth at the operating table to guard against a possible malignancy.

Upon examining the patient (a woman of fifty) I found a large hard growth in the upper outer quadrant of the breast, a growth adherent to the skin and deeper parts with enlarged axillary glands adherent to the skin; in other words, a condition in which the prospect of cure, even by a radical operation, was none too good, because of inexcusable procrastination. I performed a radical operation without first removing a specimen for examination, explaining to the patient's physician as diplomatically as I knew how that the case was so definitely one of malignancy that the removal of a specimen for microscopical examination before performing a radical operation was going to needless trouble, delay and expense, and furthermore was exposing the patient to the added risk (slight though it might be) of spreading the malignancy by cutting into it. My feeling on the subject of frozen sections of breast tumors (examined at the time of operation) is that they should be employed only in the event that the surgeon considers the growth benign or is very doubtful as to its malignancy. If a surgeon of experience makes a preoperative diagnosis of cancer of the breast, the patient is better off to have the breast operated upon radically without running the chances always associated with the examination of frozen sections. I know that many surgeons believe otherwise, and have all growths (except those that could be diagnosed as malignant on sight by anyone) submitted to at least gross examination before performing a radical operation, and if this examination is not decisive they rely on the examination of a frozen section. Personally, at the present time I believe more good will be accomplished by the average surgeon, who after all operates upon the majority of patients, if he does a radical operation upon all cases in which his clinical diagnosis is that of cancer, and if he makes use of the frozen section only in those cases in which his probable diagnosis is nonmalignant growth.

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*Read before the Harlem Medical Association, January 3, 1923.

In spite of my diplomacy in the case just referred to, the physician was evidently so offended at my not following his suggestion that from that day to this he has failed to send another patient to me, though previously I had been favored quite often, and this in spite of the fact that the examination of the removed specimen showed carcinoma.

We are, therefore, confronted with the fact that although today many more women than formerly consult their physicians as soon as they notice anything abnormal in the breast, there are many who put off their first visit so long that real help is impossible. To overcome this tendency to delay is the object of the cancer propaganda work that is being so efficiently carried on; it behooves each and every one of us to let no opportunity pass to help this work along. Much can be done to help if we make careful, painstaking examinations with this end in view, whenever patients present themselves for examination for any condition whatsoever, even a minor one. There is no reason why a woman (or for that matter a man) undergoing a chest or abdominal examination, should not be looked over carefully for a possible precancerous lesion.

Last spring a man with cancer of the breast was sent to me by his physician, to whom he had been referred by an examiner of one of the large insurance companies who had made the usual routine examination offered to the man as a policy holder of the company. That was good work on the part of the examiner, as the lesion was a small one near the areola and could have been overlooked very easily or passed over as an unimportant skin condition. There is no reason why a family physician, one who takes an interest in his patient, should not make it his business to do the same thing. We are constantly complaining that our preserves are being poached upon, but the success of the poacher is often due to the fact that we don't keep our eyes open.

However, this propaganda does not reach that medical man who when he sees a breast tumor either does not grasp the possibility of service to his patient, or who believes that he is able by "watchful waiting" to recognize the moment a tumor becomes malignant and requires operation. That man has not yet learned that the best prognosis is for those patients whose tumor has been removed before the malignancy starts.

At this point I wish to record my objection to the treatment by radium or x ray of a patient suffering from cancer of the breast, unless the patient is referred by the surgeon himself, or by the family physician after consultation with the surgeon. Among 885 malignant breast tumors reported by Bloodgood, four per cent. of the patients were under the age of thirty when the lump was first observed. In some the tumor had been in existence many years before malignancy started; in fact, its very existence for many years meant that the original growth must have been benign. Knowing, therefore, that so many malignant growths were at one time benign, and that their removal in the benign or precancerous stage forestalls the development of so serious a malady, why is it so difficult to be able to induce all physicians to advise or consent to the removal of the growth as soon as discovered?

Twenty or twenty-five years ago there might have been some excuse for this attitude. Many surgeons believed that their tactile sense was sufficiently developed to enable them to distinguish with considerable certainty between a benign and a malignant growth; but today they are not quite so sure of their skill, for all have diagnosed as benign, cases that later proved to be malignant. This is especially true in women over twenty-five. Under twenty-five years of age everyone can take a chance, unless the growth is frankly malignant. I personally never saw a cancer of the breast in a woman under twenty-five years of age; Bloodgood reports one in a woman of twenty-one.

With human nature as it is, usually shrinking from looking bad news in the face, it is well to have in mind some plan of action when confronted with conditions such as this. Today the consensus of surgical opinion as to the best plan of action to be followed when dealing with breast tumor is:

First: A freely movable, nonadherent breast tumor, which has the feel of a cyst, or fibroma or adenoma, in a girl or woman under twenty-five, need not be removed so long (and only so long) as it does not increase in size or give annoyance in other ways, such as causing pain. Bloodgood prefers to make the age limit twenty, and advises the removal of the growth even between the ages of twenty and twenty-five, which period he considers a doubtful one. Any growth which has not disappeared by the time a woman has reached the age of twenty-five, or which makes its first appearance then or later, should be removed even if the surgeon considers it benign, because one never knows when malignant degeneration may begin; a tumor which is benign and innocent today may begin its malignant change tomorrow, or it may have in its centre a small quiescent cancer deposit, which may start growing rapidly at any moment; so why wait? The only way that we can improve our results (now that our operation is fairly standardized) is to operate early, preferably in the precancerous stage, or if cancer is present, before a positive diagnosis can be easily made. Nothing can be gained by waiting. The operation at this stage is simple, can often be done under local anesthesia, and usually with but slight scarring or without visible scarring if a Warren operation is done. When the axillary glands are once involved the percentage of patients living beyond the five year period is very small (about twenty per cent.) (1).

From the viewpoint of diagnosis: If the first symptom noticed is pain in the breast, and this is followed by a growth, or if pain is the only symptom (which is often the case), the condition is rarely malignant. However, as there are cases in which a breast tumor preceded by pain is malignant, one must never permit this sequence of symptoms to enter into a decision for or against operation, though one may permit it to influence our preoperative prognosis. The safest way (the only way which will cause no regrets) is to remove all growths occurring in women over twenty-five.

A word now on the significance of bleeding from the nipple. A bleeding nipple of itself does not indicate cancer; many such have been present for years without operation, the patient remaining in perfect health. This is one occasion where watching is permissible; however, careful watching is necessary, for the appearance of a growth changes the aspect. Bleeding from the nipple plus growth means operation, either removal of the growth alone, or a radical operation for cancer, depending upon the judgment of the surgeon himself before operation, or the judgment of the surgeon and pathologist during operation, such judgment being formed by a careful examination of the gross appearance of a cross section of the removed growth, or if necessary by an examination of a frozen section made at the time.

Retraction of the nipple means cancer, even without tumor, unless there is evidence of an old mastitis or unless the retraction has been present for a long time. Even if considered nonmalignant, it must be watched carefully and constantly. I do not believe that any physician without wide experience in the diagnosis of breast conditions should on his own responsibility decide that a retracted nipple in a particular case is not malignant.

I have purposely omitted detailed discussion of the differential diagnosis of the various breast tumors, for the real object of this paper is to bring home the importance of operative procedure of some sort on every tumor of the breast occurring after the age of twenty-five. In the light of present day knowledge of the possibility of the presence of cancer, in even apparently benign growths, and the frequency of the development of cancer in growths many years after their presence becomes known to patients, any other course than this should not be taken into consideration. Simple removal may be all that is necessary, but careful microscopic examination of all (even the most evidently benign) growths should be made, and any further operative procedure should depend upon what is found.

To return to the subtitle of my paper—What can the general practitioner do to improve the prognosis of cancer of the breast? 1. He can educate himself to examine for breast tumor every woman whose chest he is called upon to examine for whatever reason. 2. He can learn to know and believe that breast tumor (i. e., a single tumor in one breast) means operation. 3. He can do his utmost to educate his patients to recognize the importance of any abnormality whatsoever in the breast.

DISCUSSION.

Dr. Joseph Colt Bloodgood, of Baltimore: A discussion of breast tumors is always timely. With Dr. Meyer's views as to the general handling of these cases I am in complete accord, for I believe that all solitary growths in the breast should be treated surgically. However, attention should be called to the fact that as a result of the educational campaign women are coming under observation for conditions of the breast for which operation is not indicated, such as pain, painful scar, discharge from the nipple, indefinite single or multiple tumors, a few definite multiple tumors, hypertrophy of the breast, etc.

I wish to emphasize the importance of palpation. If a single definite tumor is to be felt in one breast and the patient is over twenty, operation is indicated. The essential feature is, Is there a definite tumor? Many of the cases we see today are multiple indefinite tumors involving usually both breasts—the shotty mastitis; the edge of the breast is distinct and feels like a saucer. In the past the majority of these cases have been treated as cancer. This is the safer procedure until one has learned to recognize the condition as a benign lesion. Another condition which is benign but which it is safer to treat as cancer until one has learned that it is benign, is the wormlike tumor found under the nipple, usually bilateral, and due to dilated ducts. When inflamed the skin becomes reddened and the nipple may be retracted, the condition assuming the clinical picture of malignancy. It is safer to treat these cases as cancer.

The most common type of benign lesion for which operation is not indicated, is the lumpy breast, due to multiple indefinite tumors. If there are definite tumors in both breasts, or several definite tumors in one breast, the chances are that the condition is benign; it is safer, however, to explore at least one tumor to ascertain its pathology. If benign, remove it; if an adenoma, remove all the tumors; if a blue domed cyst or a lipoma, remove only the largest tumor; if malignant, do the complete operation for cancer.

As to the method of examination: I go into the history after I have examined the patient, permitting no suggestion as to which breast is involved. The patient should be stripped to the waist, reclining with hands clasped above the head. Inspect both breasts carefully. Note any change in color of skin, condition of nipple, evidence of discharge from nipple, whether one breast is larger than the other. A visible small tumor suggests malignancy. Palpate both breasts with both hands, then each breast with both hands. In the majority of cases a definite tumor is never overlooked, but schirrous carcinoma may be smaller than a ten cent piece.

In some instances palpation alone suggests cancer. The growth is hard, irregular, nodular; in other words, clinically malignant. It must be remembered, however, that a benign tumor may feel like cancer, and a malignant tumor may be smooth and lobular, suggestive of benignancy. If the tumor is clinically malignant it is safer to perform the complete operation for cancer without exploratory incision. There is no question that a small percentage of complete operations will be done for benign tumor, but it is safer.

SUMMARY.

There are: 1. Benign lesions, such as lumpy breast, multiple tumors, discharge from nipple without tumor, painful breasts without tumor, etc., for which operation is not indicated. 2. Clinically malignant lesions in which it is safer to do the complete operation for cancer without exploration. 3. Clinically a definite tumor with no definite sign of malignancy. This tumor must be explored and the patient should be prepared for the radical operation if the exploration indicates malignancy. When in doubt do the complete operation. I receive specimens from all over the country, and for the last five years it is a very rare occurrence to receive a malignant tumor in the laboratory for which an incomplete operation has been performed. This is a mistake which should not be made. Quite frequently I receive benign tumors for which the complete operation for cancer has been performed. This is the mistake which must and should be made.

Dr. Howard Lilienthal, of New York: I congratulate you upon the rare opportunity of hearing and discussing such an important topic as cancer of the breast presented in such a masterly manner by Dr. Meyer and Dr. Bloodgood. I think that in certain instances the classical radical operation in cancer of the breast should not be advised. I refer to the enormous neglected ulcerating tumors, particularly in elderly people, in which growth has been slow and axillary involvement is not demonstrable. In these cases, especially when the patients are poor operative risks, it is safer and more truly conservative to remove the breast gland alone, and treat the axillary region postoperatively by radiation; and while we are on the subject of x ray therapy I will state that for the last three years I have made it a practice to send every patient with a breast cancer for preoperative x ray therapy, postponing the operation for two weeks so that the extent of any possible erythema may be known. Finzi, of St. Bartholomew's Hospital, London, believes in this method, and Ledoux-Lebard, of Paris, has also emphasized this point. The preliminary radiation may or may not reduce the size of the tumor, but it will in any event minimize the danger of metastasis from tumor tissue possibly liberated at operation.

There is only one point in which I am inclined to differ from Dr. Meyer. Dr. Meyer thinks that nonmalignant tumors should be removed for the reason that they may become cancerous. In talking this matter over with Dr. Francis Carter Wood, he stated that benign tumors do not become cancerous, that a cancer may develop in a benign tumor the same as it may develop in any part of the body, but that it is not a transformation of benignity into malignancy. It is my opinion that neoplasms of the breast should be removed because they may be cancerous, not because they may become cancerous. The therapy is the same as that advocated by Dr. Meyer but the reasoning is different.

Dr. Benjamin T. Tilton, of New York: In his discussion of Dr. Meyer's paper Dr. Bloodgood referred to the importance of the physician being familiar with the changes in consistency of the breast during pregnancy and lactation. I should like to call attention to the great importance of discovering a carcinoma before delivery as lactation results in a very rapid growth of the tumor and dissemination through the lymphatics. Operation should always be performed before delivery even though the patient is in the last weeks of pregnancy. Operation deferred until lactation means usually death from metastasis in a few months. All cases in which I have operated after having the patient brought to me shortly after delivery have terminated fatally with extraordinary rapid dissemination. On the other hand, I have operated in a number of cases during the last months of pregnancy and no recurrence has occurred. In one case delivery occurred on the tenth day postoperative without untoward incident. It is of course very important to these women in the later months of pregnancy to be sure of the diagnosis before subjecting them to the radical operation. Excision of the whole tumor and immediate frozen section report from the laboratory should be employed in doubtful cases. In general, it is regrettable that many physicians delay in sending cases to the surgeon because the swelling in the breast does not have what they think are the typical signs of carcinoma. It is, for example, not painful, is not situated in the usual position, the pig skin appearance is not present, etc. The important thing is the presence of an abnormal lump in the breast, especially after twenty-five. This lump should not be kept under observation, but the responsibility shared at once with a competent surgeon who will remove it either by excision or radical operation unless he is positive in his own mind after long experience that it is a benign nonoperative affair, such as chronic mastitis.

Dr. A. O. Wilensky, of New York: The keynote of the discussion has been education. It is not sufficient to educate the laity. Physicians themselves are in need of much more knowledge in regard to malignant tumors than they possess now. A great deal of emphasis has been laid on the presence of a palpable mass. Permit me to make comparison with appendicitis. A cancerous growth in the stage in which it presents a palpable mass is analogous to an appendicitis which has been allowed to go on to the stage in which an abscess has formed and localized. All will surely agree that such an appendicitis has been allowed to go on just a little too long. We should have preferred to get the disease in the earliest stages—in the socalled catarrhal stage. So with the tumor; a mass is exactly equivalent to an abscess and already we are somewhat late in our therapeutic attack on the neoplastic disease. In order to obtain the best results with operation on malignant breast tumors we ought to be able to recognize the disease before a palpable mass is present. To carry the analogy still further, a breast carcinoma with a palpable tumor and enlarged tumor bearing glands in the axilla, above the clavicle or in the mediastinum, is a very late condition; it corresponds to an appendicitis with a localized abscess and with general peritonitis of a severe grade. All of us know that when appendicitis has gone so long as to produce peritonitis, someone has blundered, either patient or doctor, let us say in charitable spirit, unknowingly. And so with the tumor; the presence of infected glands means that the disease is in its late, perhaps terminal, stage.

So we see that we doctors are ourselves in need of much more knowledge concerning the very earliest stage of neoplastic disease. Much has been said of precancerous conditions. In the breast this refers to those degenerative forms of pathology called chronic cystic mastitis, a condition characterized by a profusion of irregularly dilated acini with change in the interstitial tissue and frequently with hyperplasia of the glandular epithelial elements. Sometimes this latter hyperplasia becomes lawless and uncontrolled and breaks through the basement of the acinus; then a malignant disease is present. Dr. Bloodgood is quite right in saying that this change has nothing to do with the original chronic cystic mastitis. There is no reason why such a breast, the seat of this involutional change, may not have a carcinoma growing in it which occupies the same relationship to it which it would to an unchanged normal breast; a tumor begins to grow in one, and for exactly similar reasons and causes, a tumor begins to grow in the other. Are we right in assuming that the involutional change is the cause of the neoplastic disease? The presence of the former need not necessarily be predisposing to the latter. And it is not at all certain that it is so.

Here is where our efforts must be directed. Progress in this dread malady has heretofore been perceptible because of a change in the attitude of the laity which causes the patient to consult the doctor much earlier in the course of disease; because of a greater diffusion of diagnostic knowledge among medical men, and because of increase of diagnostic acumen; because the patients coming earlier and earlier to us there is a progressive increase in operability; because of improvements in operating technic and ability; and because of the additional help of radium and the x ray. Progress hereafter must come from a knowledge of the causes, mechanism and biological phenomena of neoplastic growth. In these respects we doctors must be further educated; in these respects progress will henceforth be made.

Dr. Leo B. Meyer (in closing): Dr. Bloodgood, in his discussion, says that patients are referred to him so promptly after the onset of trouble with their breasts, that he finds sixty per cent. of the growths benign and only forty per cent. malignant. I am sorry to say that in my practice the reverse is true. Over seventy-five per cent. of the cases seen by me are malignant. Dr. Bloodgood's percentages speak well for the influence his teachings have had on those that come within reach of them. We are all hoping for the day when not sixty but seventy or even eighty per cent. of breast tumors examined by us will be benign, and this day will come when women will learn to consult their physicians as soon as they feel a lump in the breast. The nearer we get to this day the greater will be the surgeon's responsibility, as the differential diagnosis will be more difficult, almost impossible clinically and often doubtful after the exploratory operation, even with the aid of a frozen section. Dr. Bloodgood emphasizes the fact that when at the exploratory incision the naked eye appearance and the frozen section leave you in doubt what to do, the radical operation for cancer is best for the patient. This may result in some unnecessary radical operations where a less extreme one might have been sufficient, but there will be fewer (there should be none) incomplete operations for cancer. With this dictum I am in absolute accord. Thus far I have done no radical operation for benign lesion, but some day no doubt I will do one. When this occurs I shall certainly feel pretty bad, but not as bad as I would at doing a minor operation for cancer.

In my paper I have dealt mainly with the problem of how to shorten the time between the discovery of the growth and the visit to the surgeon. What is done after the surgeon has examined the patient is a question for his judgment. Whether to do a complete radical operation in large ulcerating cancers of the breast without axillary involvement, treating the axilla with x ray after the operation, must in the last analysis be up to the surgeon. I go one step farther than Dr. Lilienthal here; I think that even if there is axillary involvement, it might be advisable to remove the ulcerating mass without touching the involved axilla, relying solely on the x ray to delay extension. This after all is nothing but a palliative operation and to discuss these matters in detail here would take us too far afield. As to the use of röntgenotherapy before and after operation, I have for the past year been using it. I am unable to say as yet whether there is any material advantage, but I feel that we should give the patient the benefit of every possible means for cure at our command. In passing, it is worth while mentioning that not all workers in this field are agreed as to its benefits. I remember reading the report of one of the large clinics abroad in which the results seemed worse in the series of cases treated preoperatively by x ray than in those that were not so treated. It is possible that with the new powerful machines being used now the results will be more worth while.

From the viewpoint of treatment it makes very little difference whether a breast tumor diagnosed as benign is more likely to become cancerous than normal breast tissue, or whether it harbors a quiescent clinically undiagnosable cancer from the beginning. Dr. Lilienthal and I agree that the growth should come out. In considering this matter it is worth while taking into account the psychology of a patient who has, let us say, had a benign growth in her breast for several years. If she is told that the growth is benign and is no more likely to become cancer than her other breast, she will feel so secure that should the growth change its character she will be more apt to put off consultation with her physician than if some change should occur in her other breast, so that even if we could be certain that a growth is benign, the best advice would still be to remove it.

There can be no question about the danger of lactation to a breast the seat of cancer; the engorgement due to lactation will increase the rapidity of dissemination. No one could disagree with Dr. Tilton that in a pregnant woman, once the diagnosis of cancer of the breast is made, operation should be immediate; to wait until after delivery practically dooms the patient. One should keep in mind always, however, that the difficulty of making a diagnosis of cancer of the breast in a pregnant woman is much greater than in a nonpregnant one, because of the size of the breast and the lumpiness which (while it may be present in any breast, and if present may render diagnosis more difficult) is exaggerated in the breasts of pregnant women.

I agree with Dr. Wilensky that all of us are in need of more knowledge on this subject. That we are not yet educated up to the point where we can always be positive that a given mass is or is not cancer is sufficient reason for our not being dogmatic in our preoperative diagnosis. True, our diagnostic ability is better than formerly, but it must improve much more to do justice to the patients who will consult us earlier and earlier as cancer education gets in its effect. The proportion of benign tumors will naturally grow larger and larger, and we surgeons must, if possible, develop our diagnostic acumen to a degree that will enable us to differentiate positively between a benign and a malignant growth. That stage we have not yet reached, and until we do, it is to the patient's benefit to lean towards apparent radicalism rather than conservatism when dealing with tumors of the breast.

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Gastrointestinal Infections in Chronic Arthritis

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TYPES OF ARTHRITIS.

Chronic diseases of the joints present a perplexing problem so far as classification is concerned. For the purpose of this paper it suffices to divide this group of diseases into two types. Type 1 is characterized by proliferation of the synovial and lymph marrow, causing degeneration of the bones and cartilage. Type 2 is characterized by degeneration of the synovia and lymph marrow, causing hypertrophy of the bones and cartilage.

The first type includes clearly defined infections of the bones in tuberculosis and syphilis. The second type is sharply differentiated from the first and includes what is known as arthritis deformans, or osteoarthritis, or degenerative arthritis. This type has also been designated by some authors as hypertrophic or metabolic and senile arthritis. It is not infrequently found in the elderly in the form of Heberden's nodes or nodules of the terminal interphalangeal joints and in this form is often confused with gout.

CLINICAL DATA.

Beginning with March, 1910, and continuing until May 31, 1922, we had occasion to study the relation of gastrointestinal infections to arthritis. The series of cases observed in this way and here reported falls under the second of the types described above, thus excluding tuberculous and venereal infections. During this period 2,973 cases in all passed under our observation. The ages of the patients ranged from twenty-three to eighty-five years, eighty-seven per cent. being over thirty-five years of age. In classifying these cases we for convenience divided them into two groups, one, which we termed the upper zone, including infections of the mouth, nose, and throat, and the other, which we termed the lower zone, including infections of the intestines and their appendages.

During the first four years of this investigation, i. e., from 1910 to 1914 inclusive, patients having infections of the upper zone only represented fourteen per cent. of the cases observed, patients having infections of the lower zone only represented fifty-eight per cent. of the cases observed, and patients having infections of both zones represented the remaining twenty-eight per cent. From 1914 to 1922, inclusive, of the patients observed fifteen per cent. had infections of the upper zone only, sixty-three per cent. had infections of the lower zone only, and the remaining twenty-two per cent. had infections of both zones. The results obtained in these two periods are cited separately for the reason that our technic in connection with the isolation of streptococci from the cecocolon was improved during the second period and that during this period the patients observed had received better attention to nasal, tonsillar, and dental infections. Thus, while the figures, as given above, indicate an increase in the percentage of lower zone cases during the second period, this may well enough be due to these two contributory factors.

Of the entire number of patients who came under our observation during these twelve years sixty-nine per cent. reported that they had had operations in the upper zone (nose, tonsils, teeth, etc.) in order to remove focal infections. Of these, twenty per cent. reported that they had experienced a marked improvement in arthritic conditions, thirty-six per cent. reported a slight improvement, and forty-four per cent. were apparently worse, i. e., they gave histories of more frequent and severe attacks of arthritis, often in joints never before affected.

The facts here stated regarding the clinical results following surgical treatment of focal infections in the upper zone are not offered as a criterion of the efficiency of surgical means in such cases. It is a logical inference that patients who were either cured by such means or experienced marked relief from them had no occasion to seek further treatment and therefore did not come under our observation. It is also evident from our figures that while sixty-nine per cent. had had upper zone infections, only forty per cent. had them at the time they came to us.

It is, however, obvious from the same figures that surgical procedures in the upper zone, while effective locally, are often effective only for the time being so far as the general condition is concerned. The operation removes the focus, it is true, but it does not remove all the invading bacteria, usually leaving some few stragglers to start a colony elsewhere that will become an active source of infection later on under conditions favorable to its development. If we assume, as we reasonably may, that these offending organisms are members of the elusive family of streptococci, it at once becomes apparent that the failure of surgical measures in such cases is due either to the fact that the focus removed, such, for example, as a dental abscess or diseased tonsils, was not the only one where these invaders had entrenched themselves or else to the fact that the operation was unsuccessful so far as complete elimination of the invading bacteria was concerned.

ELECTIVE LOCALIZATION AND THE OPSONIC INDEX.

In our study of this series of cases the opsonic index was used as a criterion of the patients' resisting powers to streptococcus. Early in our investigation in this direction we were confronted with an interesting problem. A marked variation was observed in the opsonic index in relation to different strains of streptococci. For example, strains isolated from dental abscesses, infected tonsils, diseased gallbladders, and other particular locations, brought out marked differences in opsonic response on the part of the patient. The quality of this response was sometimes vigorous, sometimes merely fair, and sometimes negligible or even entirely negative. As our investigation proceeded it became increasingly evident that a selective force of some kind was at work, that affinities existed between strains of bacteria isolated from the same location in different persons. Cecocolon streptococci responded to those from the cecocolon, tonsillar to tonsillar, and so on. We finally demonstrated the fact that this selective peculiarity amounted to a definite law.

We therefore made the computation of the opsonic index to strains of streptococcus isolated from different locations a part of the routine procedure of examination in all arthritic cases and by this means were usually enabled to determine the location of the focal infection. The procedure employed was as follows: First, recently isolated strains of streptococcus and bacillus coli from definite anatomical locations were taken and employed as stock cultures. These locations in the case of streptococcus were 1, tonsils; 2, dental abscess; 3, gallbladder; 4, cecocolon; 5, prostate; 6, uterus, and, 7, urinary bladder. These organisms were cultivated in acetic glucose broth and transplanted frequently. The strains of bacillus coli were isolated from, 1, the cecocolon; 2, the gallbladder, and, 3, the urinary bladder. These organisms were cultivated on plain agar and classified according to the fermentation test on manite, lactose, and salicin. The opsonic index for these different strains of bacteria was computed according to Wright's method.

From the data gathered from this procedure we found that the patient usually exhibited a low resisting power to one particular strain of streptococcus. There were exceptions to this, some patients exhibiting such low resistance to strains from three or four different locations. These were classified as multiple infections. In the great majority of cases, however, a low opsonic index was registered for one strain only. A specimen was then obtained from the particular location indicated, for example, if the patient's opsonic index registered low to gallbladder streptococcus, a specimen was obtained from his gallbladder by duodenal drainage. If the low resistance was to a cecocolon strain, a specimen was obtained from that source by means of colon drainage, and so on. This specimen was planted in acetic glucose broth and cultivated for six hours. About one c. c. of this culture was then inoculated intravenously into a laboratory animal (rabbit), which was sacrificed after forty-eight hours. A postmortem examination usually revealed a focal infection in the animal in the location corresponding to that of the infection in the patient. From the lesions in the animal the organism was obtained in a pure culture.

INFECTIONS OF THE CECOCOLON.

Returning to the question of location, it has been noted that the majority of the cases we had under observation showed infections of the lower zone. These infections were for the most part in the cecocolon, which would indicate that this is the location most favorable to streptococcus cultivation. As is well known there has been a great deal of discussion as to the reason for the presence of pathogenic streptococci in the lower intestines and also as to the relationship between such streptococci and those in the oral cavity, in view of the fact that cecocolon infections by streptococcus are so frequently preceded by oral infection due to the same type of organism. The theory has been advanced that these organisms travel by way of the alimentary canal from the mouth to the intestines and there effect an entrance through the mucous membrane into the deeper tissues. It is a well established physiological fact that the normal mucous membrane of the intestinal tract offers marked protection against the inroads of bacteria. Any break in its continuity, however, or increased permeability due to trauma or other causes, affords a ready entrance for these microorganisms. In the opinion of others pathogenic bacteria are transmitted from focal infections in the oral cavity to the intestines by way of the bloodstream. The question might be raised as to why, if these bacteria are thus carried by the bloodstream, a general septicemia does not result or why focal infections are not simultaneously set up in other parts of the body. The answer to this lies in the elective localization of these bacteria, which causes them to select the intestinal canal as their habitat. This predilection may be explained by the somewhat similar conditions existing in the mouth and the intestines. Rosenow has demonstrated experimentally with rabbits that intravenous injections of streptococci isolated from lesions of the appendix are followed by marked localization with corresponding lesions in the inoculated animals. On the other hand he was unsuccessful in producing appendicitis by way of the mucous membranes unless the blood supply of this region was markedly interfered with. Whether one, or the other, or both of the theories discussed be true, the fact nevertheless remains that bacteria tend to change their characteristics with their environment and to develop special affinities for those locations in which they have cultivated themselves for a certain length of time. While strains of bacteria from different locations are microscopically identical their biological functions differ materially with their environment. This difference of function may well explain the variations of the opsonic index.

The fact that the intestinal tract of a newborn child is sterile, but becomes infested with bacteria in a few hours, coupled with the fact that the life history of the child repeats in many respects that of the race, tends to show that the alimentary canal, and particularly the colon or large areas of it, was the original seat of focal infections and consequently is today the most vulnerable point to the invasions of pathogenic bacteria.

Ewings's pathological report of a great number of cases of colon infection shows the presence of definite gross anatomical lesions, such as pigmentation of the mucosæ, which was most frequently evident in the sigmoid portion. This was often associated with thinning of the intestinal wall in places and with erosion and ulceration of the mucosæ. This condition would readily permit the absorption of toxic fluids and pathogenic bacteria that would lead to general toxemia resulting in the disturbed metabolism that is so characteristic of arthritic patients.

FORMS OF TREATMENT.

The treatment of arthritis naturally divides itself into three objectives: 1, the elimination of focal infections; 2, the elimination of toxic substances produced by faulty metabolism; and, 3, the restoration of glandular efficiency.

REMOVAL OF FOCAL INFECTIONS.

The removal of focal infections is by far the most important of these procedures. Owing to the fact that the location of such infections is frequently obscure the treatment of arthritis has in the past been somewhat unsatisfactory. In the case of infections that are definitely located surgical removal is indicated when the focus is so situated as to render this possible. When the conditions are not operable immunization of the patient should be resorted to by inoculation with specific bacterial antigens.

By specific is meant a bacterial antigen produced from a particular strain of bacteria isolated from lesions in the human body which involve tissues or structures to which this particular strain has a peculiar affinity. The elective localization of bacteria is not new. It is well known, for example, that pneumococcus elects to locate in the lungs, gonococcus in the urethra, the typhoid bacillus in Peyer's patches, and so forth. Furthermore, even among those species of microorganisms whose distribution is more general, such as streptococcus, staphylococcus, and bacillus coli, we find that certain strains have a specific affinity for definite tissues and organs. Rosenow has demonstrated this peculiar inherent property of bacteria and proved by his experiments that intravenous injections of specific strains of bacteria into laboratory animals usually result in the development of lesions in the animals in the regions corresponding to those from which these strains have originally been isolated. Our own investigations from 1910 to 1922, inclusive, confirm his findings and indicate that in the study of elective localization lies the key to a more scientific application of bacterin therapy, which should result in the bringing about of more uniform immunizing response.

The responsiveness of the human economy to certain strains of bacteria by which it happens to be infected is not unlike that of a wireless apparatus to currents of a certain wave length. It would seem that when focal infections caused by a particular strain of microorganism are established in any part of the body, the system becomes much more responsive to that strain than to any other, just as a wireless outfit may be attuned to respond to waves of a given length and to those exclusively. The inherent tendency of all bacterial life to change its characteristics in the process of adapting itself to its environment produces these selective local strains and tunes up the body, so to speak, to respond to them, when introduced from without, by an immediate production of suitable antibodies. Prophylactic and therapeutic immunization with specific bacterial antigens is based on this inherent tendency of microorganisms and the brilliant results often secured may be directly ascribed to our ability to take advantage of this natural law.

ELIMINATION OF TOXINS.

The elimination of toxic substances produced by faulty metabolism may take place in several ways. The avenues of elimination are the intestinal tract, the kidneys, and the skin. All three of these should be taken advantage of. The intestinal tract may be emptied by the administration of suitable cathartics, but it is generally more advantageous to employ duodenal or transintestinal lavage or free colon drainage. By these means the entire alimentary tract can be relieved of offending substances. After the intestines have thus been cleared, lactic acid bacteria may be introduced in order to change the character of the intestinal flora. The activities of the kidneys may be increased by mild diuretics, of which there is nothing better in most cases than pure water taken in sufficient quantities. The excretion of poisons through the skin may be stimulated by hydrotherapy. In this connection mineral baths have proved of considerable value. While the action of such baths is not as yet definitely understood, it is known that they act not only as stimulants to the skin but also produce an alterative effect. These effects may be due in part to the radioactivity of certain waters and in part to their constituent mineral salts. It has been proved that while the patient is in the water these salts are deposited on the skin and gain entrance into the pores. The minute deposits thus created cause first a stimulation and then a general counter-irritation, thus increasing the superficial circulation. They also lead to complex chemical changes that we have not the space to describe, which are alterative in their action.

GLANDULAR UNBALANCE IN ARTHRITIS.

Glandular insufficiency in its relation to arthritis is a subject that is considerably misunderstood and also considerably underrated. We have already pointed out that focal infections of the alimentary tract are present in a large majority of arthritic cases. These infections are probably of long standing and represent a losing battle on the part of the system against the inroads of invading bacteria. This battle begins in infancy and turns toward defeat at that period of life when, owing to the strain of the exacting conditions under which we live, the toxins created by inimical bacteria accumulate to such a degree that they give rise to glandular unbalance. This occurs because the glandular secretions poured into the blood that stimulate the development of antibodies finally become insufficient for the performance of their functions, owing to the excessive demands upon them. Certain of the overloaded glands tend to exhibit alteration of physiological function and their secretory power becomes curtailed. This at once impairs the efficiency of the particular organs that are normally kept at par by the presence of these secretions carried to them by the bloodstream. This impairment weakens the resisting power of the organs concerned, which thus fall an easy prey to the inroads of bacteria that in turn tend to weaken them still further. A vicious circle is thus created that works always for more and more unbalance in the interlocking system of glands that controls our vital processes and that presents a constantly diminishing check to the inroads of pathogenic bacteria.

It is now known that upon the appearance of bacteria in the bloodstream the toxins created by them give rise to a defensive reaction in the body as a whole. This defensive process appears to be as follows: The presence of toxins in the blood excites the thyroadrenal centre, thus giving rise to secretions that have the effect of increasing oxidation and metabolism throughout the tissues and of producing an excess of phagocytes of a peculiarly aggressive type. The red blood corpuscles are also stimulated to the secretion of opsonins and amboceptors, which have the effect of softening and sensitizing the invading bacteria, which are then ingested by the phagocytes and digested by the trypsic ferments.

Inasmuch as each gland in the body secretes a fluid that, carried by the bloodstream to some other gland or organ, stimulates such gland or organ to its proper degree of activity, a diminution of the normal secretory power of any gland necessarily makes for unbalance, as we have shown. When the focus of infection has been removed and the toxic substances that produced disturbed metabolism have been eliminated the affected gland often fails to resume its physiological function. It then becomes necessary to administer the lacking secretion in the form of a glandular extract until the gland returns to normal.

The routine procedure followed in our treatment of these arthritic cases, and still practised in such disorders, begins with the locating of the focal infection. Certain facts in the patient's history serve as a guide to acute infectious processes from which he has suffered in the past. Physical examination gives certain indications in the present. The opsonic index is then computed with reference to particular strains of streptococcus isolated from various locations known to be frequently infected, as dental abscess, tonsils, gallbladder, cecocolon, and prostate. This usually points to a definite location as the site of the infection. When possible the infecting organism is then isolated from this particular location in the patient and an antigen is prepared therefrom, with which he is immunized. The initial dose is usually one half c. c., which is repeated every twenty-four hours, being gradually increased until one c. c. is reached at the end of nine days. A second opsonic index is then taken to check the patient's progress. Daily inoculations of one c. c. are given thereafter until the opsonic index, which is taken every nine days, reaches normal. After this inoculations are given every three days for three or four weeks, in order to raise the patient's resisting power to a high level. Our records covering a twelve year period show that the length of time required for immunization ranges from thirty-six to sixty-nine days, with an average of forty-seven days.

The clearing of the alimentary tract is usually accomplished by free colon drainage and the administration of suitable laxatives and intestinal antiseptics. The colon drainage is given daily for about twenty days, then every second day during treatment.

Hydrotherapeutic treatment is given daily in the form of mineral baths. Local applications to the affected parts are made when indicated. This is accompanied by massage, electrical treatment, and mechanotherapy when required. Free diuresis is produced by encouraging the patient to drink considerable quantities of water at frequent intervals.

All the measures described are carried out simultaneously from the beginning of the treatment. The administration of glandular extracts as a means of restoring glandular balance begins during the progress of the treatment at a point determined by the rise of the opsonic index. When the index falls below the normal curve exhibited in arthritic cases under treatment the administration of glandular extracts is begun. If the curve remains normal to the end of the treatment the extracts are not employed. After immunization is completed, however, glandular extracts are always administered in small doses for some weeks, with an intermission of about the same length, when the process is repeated anew, continuing as a rule for some months.

It may here be noted that the administration of monoglandular extracts is usually much more effective than the hit or miss method of giving polyglandular preparations. Specific therapy is here indicated just as clearly as in the case of bacterial antigens. By stimulating the particular gland that is at fault the glandular balance of the body as a whole tends to be restored. Polyglandular extracts, on the other hand, tend to overstimulate some glands while raising others to normal efficiency and may produce complications due to the substitution of one form of glandular unbalance for another.

The amount of food consumed in chronic arthritis is a very important matter. The patient should be restricted to some extent in his normal consumption of food, in order to facilitate complete metabolism. Our records show that the average arthritic patient consumes from twenty-eight hundred to three thousand or more calories a day. Such patients can be reduced to two thousand calories a day and still maintain good nutrition. In order to provide the necessary bulk under this régime a plain diet is indicated rather than a rich one.

The routine treatment described above produced satisfactory clinical results in the great majority of cases in the series we have discussed. We hope in a future paper to analyze certain typical conditions and also certain specific peculiarities in arthritic patients which have led to the development of special therapeutic measures that have proved effective.

The Significance of the Spinal Mercurial Manometer*

By A. S. MACLAIRE, M. D.,
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The spinal mercurial manometer is unknown and unheard of by most physicians and many of the large hospitals in New York do not possess the apparatus. Even many neurologic surgeons do not employ it in their work where it is of greatest value.

The spinal mercurial manometer is today undergoing the same trials and tribulations that the blood pressure apparatus suffered thirty years ago. What physician at present fails to record a blood pressure reading before he completes his physical examination and renders his diagnosis? Yet the neurologist and neurosurgeon are contented to regard their examinations as complete without an accurate intracranial pressure reading. At the same time they demand accurate blood pressure findings. Their reasoning and logic are as fallacious as the former clinician who opposed the blood pressure apparatus.

Today the neurologist and the neurological surgeon do not deny the importance of the knowledge of the presence or absence of increased intracranial pressure, but they attempt to estimate it roughly, judging from the spurt of the spinal fluid as it rushes out from the lumbar puncture needle. If the fluid exudes drop by drop it is evidently not under pressure; if it comes out in a stream, then of course it is under pressure; but what degree of pressure they do not know. Accurate readings are essential if we are to treat cases to the best advantage of the patient. How else are we to determine scientifically when a case is to be treated by expectant measures, or by operative procedures? This becomes of utmost importance in traumatic brain injuries. The method of most neurologists and neurologic surgeons in determining intracranial pressure parallels the method employed by the former opponents of the blood pressure apparatus. The old clinician estimated his blood pressure with his finger on the pulse. A full, bounding pulse indicated high pressure, how high he did not know. No one today will presume to say that to determine blood pressure by means of touch is unreliable, yet neurologists and neurosurgeons are using a similar method when they do not use a spinal mercurial manometer for intracranial pressure. Both tests and devices are similar, one being for blood pressure and the other for spinal fluid pressure.

We are now in an age of medicine and surgery where we are constantly striving for early diagnosis and early institution of proper rational therapy. Here is such an apparatus for the neurologist and neurologic surgeon, yet they disregard it. I recall vividly two cases occurring recently in two of our large New York City institutions, in which operation was delayed several weeks because of uncertainty in diagnosis, where the fundi failed to reveal the desired information of increased intracranial pressure and where the spinal manometer would have decided the issue had it been employed. To wait for choked discs to occur is as bad neurological surgery as it is in general surgery to allow an appendiceal abscess to form before operating. Choked discs signify a greatly increased intracranial pressure over a prolonged period. The manometer detects early rises in pressure and can be closely watched by repeated readings. It is true that in a slowly growing intracranial neoplasm the changes in intracranial pressure are not as rapid as in traumatic cerebral conditions, nevertheless they do occur. Instead of daily manometric readings, as in the traumatic cases, readings are taken once or twice a week in brain tumors when the slightest rise in pressure will be detected early. No fear need be entertained for medullary injury in puncturing the subarachnoid space, for no fluid need be lost in this test. No fluid need be removed. This method will obviate the undesirable secondary optic changes that occur in choked discs.

The cases referred to above were as follows:

Case I.—This was a case of left cerebellar pontine angle tumor without changes in the fundi. To me it appeared like a clean cut cerebellar pontine angle tumor, as it did to the operating surgeon on service, yet two neurologists made the diagnosis of multiple sclerosis, because of the absence of choked discs. The spinal mercurial manometer would have supplied the information the two neurologists were seeking. At operation a left cerebellar pontine angle tumor was found.

Case II.—This case, at another hospital, was a left hemiplegia with indefinite sensory findings on the same side. The fundi examined on several occasions by two ophthalmologists gave differences in opinion at each examination. At no time did they concur in their findings. There was uncertainty as to obscuration of the disc margins and beginning engorgement of the veins. Normal fundi were finally reported by the attending ophthalmologist at the last examination. At operation a huge endothelioma was disclosed and removed. The spinal manometer would certainly have been a great aid here in the diagnosis of increased intracranial pressure. The blood pressure was misleading in this case, not being much elevated, proving that the blood pressure is a poor indicator of early changes in increased intracranial tension.

Especially in traumatic cerebral surgery are spinal manometric readings essential. In a recent case of fracture of the base of the skull (1), occurring in one of our large hospitals not equipped with a spinal manometer, the condition was permitted to drift from the initial stage of shock into that of medullary compression and eventually of medullary edema before calling in the consulting neurological surgeon to operate. To those specializing in neurological surgery it is selfevident that when a case reaches the stage of medullary edema operative procedures are absolutely contraindicated. In such cases death almost invariably supervenes, either with or without surgical intervention. I do not wish to imply that every patient operated upon before medullary edema sets in survives, but I do wish to emphasize the fact that patients with increased intracranial pressure of

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*From the Neurosurgical Service of Dr. William Sharpe, New York Polyclinic Hospital and Medical School.

15 mm. Hg. or over, if operated upon early enough, have at least the best chances for recovery, not only of life but of future normality. Those with a pressure under 15 mm. Hg. may be treated expectantly by repeated lumbar tappings and the removal of fifteen to twenty c. c. of fluid until the pressure reaches the normal 5 to 9 mm. Hg.

The excuse given at this hospital for its negligence was that under expectant treatment the high shock pulse came down to normal and continued to drop to 60 and lower. The blood pressure came up from the low shock pressure to the high blood pressure of over 160 mm. Hg. These two signs are late indicators of medullary compression. Had the spinal manometer been used routinely after the recovery from shock, operative intervention could have been instituted at a time when the patient could have been given a chance for ultimate recovery. As it happened, the patient was left to cope with the situation himself and medullary edema occurred. Not all cases of medullary edema are fatal. Rarely recovery as to life takes place, but the patient is left either emotionally or physically impaired. He complains of those symptoms which stamp him as suffering from a posttraumatic neurosis, whereas in reality he is suffering from the effects of a prolonged increased intracranial pressure.

One cannot any longer hope to perform brain operations, especially traumatic brain surgery, intelligently and scientifically, without the use of the spinal mercurial manometer. In its wider adoption many needless deaths will be prevented.

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An Appraisal of the Newer Methods of Deep Röntgen Therapy*

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In this effort to review the present situation regarding deep x ray therapy and to make an appraisal of its value I shall refer only in passing to the advances recorded in a number of benign conditions, such as hyperthyroidism, uterine myomata, ununited fractures, tuberculosis, various forms of neuritis, chronic arthritis, especially that due to gonorrhea, prostatic hypertrophy, hypertrophied and infected tonsils and adenoids, as well as in a number of conditions where it is hoped that the effect of the modified dose administered will be the stimulation of certain processes (socalled irritating doses); my remarks at this time will be confined to the employment of röntgenotherapy in deep seated malignant disease.

The basic principles which underlie the newer methods of deep röntgenotherapy may be set forth briefly as follows: First of all, one must have a generating apparatus capable of sending constantly and continuously through the x ray tube a current at hitherto unprecedented voltage 200,000 or more. It has not yet been demonstrated that higher voltages than this are perceptibly more useful or more desirable, but if it should prove that they are, there is no reason why they cannot be made available. This high voltage through the tube produces x rays of relatively shorter wave length and correspondingly increased penetrating power, more and more approaching that of the gamma rays of radium, though by no means reaching the gamma figures. Dessauer is responsible for the statement that the absorption coefficient of the röntgen rays, as expressed by μ for water, is 0.7 for the medium soft diagnostic rays; 0.26 for the medium hard diagnostic rays; 0.21 for the hard diagnostic rays; 0.18 for the deep therapy rays of six or seven years ago; 0.155 for the hard rays of 1918; and 0.134 for the best German equipment of 1920; whereas for gamma rays of radium μu (water) is 0.043.

It is evident that marked progress has been made in producing more penetrating röntgen rays, and that we may look upon the radiation provided by our present 280,000 voltage apparatus as closely approximating, in penetrating power, the gamma rays of radium.

Naturally, the higher penetrating power of the new rays permits the use of denser filter materials; and the application of the electroscope and the ionization chamber to the study of these problems permits the determination of the exact amount of filtration necessary to produce a practically homogeneous radiation. It seems from present knowledge of the subject that there is proportionately little advantage to be gained by filtration through more than a half millimetre of copper or zinc plus 3-4 mm. of aluminium, though I have for nearly two years employed a filter of one millimetre of copper plus ten millimetres of sole leather. Studies leading to this conclusion have been made with currents of not higher than 200,000 volts delivered to the tube.

Elucidation of the once perplexing question of scattered radiation and the success of the ionometric methods of measurement of the actual amount of radiation arriving at a given depth in the tissues have made plain two other important conditions for the new röntgenotherapy, viz.: 1, long distance radiation, placing the focus of the tube at from fifty to one hundred cm. from the skin, and 2, the employment of larger fields (ports of entry), thus taking advantage of the proportionately increased scattered radiation, materially increasing the dose of x ray absorbed in the depths of the body.

In the absence of ionometric determinations, it is thus necessary, in recording röntgen rays application, to specify six factors: 1, voltage through the tube; 2, milliamperage; 3, filtration; 4, target skin distance; 5, size of field; 6, time of treatment.

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*Read at the annual meeting of the New York Academy of Medicine, January 5, 1922.

No attempt will be made in this paper to describe the technic of application. Each case must be studied individually, and the plan of campaign mapped out after careful consideration of the extent and anatomical location of the malignant, or potentially malignant, tissue it is necessary to reach. Whether one will employ multiple fields on the crossfire principle, with relatively short focus skin distance, or one or two fields at very great target skin distance, will depend on the case. The deeper the lesion, the uterus for instance, the more appropriate will be the crossfire method, and the more favorable the prognosis; the nearer the lesion to the surface, the breast for instance, the more difficulty in delivering a sufficient radiation dose, and the more likelihood of succeeding with a longer distance, large field irradiation.

Permit a reminder that sufficient time has not yet elapsed for the observation of cases for the usual five years since treatment by the refined methods outlined above. Indeed, scarcely two years have gone since the wide adoption of this technic. Yet results thus far obtained, concerning the reliability of which there is no gainsaying, warrant a certain amount of pardonable enthusiasm in the pursuit of this path of inquiry, and a decided optimism in the outlook for the future of deep röntgenotherapy in certain cancers, which, though inoperable, have not yet progressed to the stage of cachexia and metastasis.

It would seem to the "lay" physician that we have almost reached the limits of possibility in the physical measurement of x ray doses. What we need most is a biological standard easily recognized by various workers with which our physical estimations may be collaborated. Important work has been done by such investigators as Wood and Bovée in this country, Regaud of Paris, and their associates; and we expect them to furnish the next step necessary to a rational basis for the radiation therapy of cancer.

It is true, a sort of biological standard has already been proposed, and it is the only one we are able to employ at present, viz., the skin erythema dose. Upon it is based all the work of the Freiburg, Erlangen, Frankfurt, Berlin, and other German schools of modern deep therapy. It is the one reaction in the limelight in radiotherapy all these years; yet so varying are the conceptions of different men as to what reaction marks a skin erythema dose, that there must be opportunity for wide divergence of opinion in calculating the dose delivered to deep seated lesions. One school understands an erythema dose to signify that amount of x ray which will within nine to fourteen days be followed by a slight reddening of the skin, and in four weeks by a definite brown pigmentation. Another school conceives the erythema dose to involve a much more pronounced reaction, with vesiculation of the skin. Regaud, of Paris, defines a proper skin reaction as characterized by an almost dry radioepidermatitis, with desquamation, renewal of the skin in about fifteen days, and finally often a blanching of the skin in place of a pigmentation. Experienced radiologists are also well aware of different radiosensitiveness of the skin of different parts of the body. Decidedly, a better and more constant biological standard is desirable.

Based on the rather unstable skin erythema dose, efforts have been made to establish the carcinoma dose, the sarcoma dose, the castration dose, and the other biological doses, especially by German workers (Kroenig and Friederich; Seitz and Wintz; Halberstaedter; and several others). The figures given by Kroenig and Friederich are lower than those of Seitz and Wintz, but the differences are explained by their different conception of the reactions characterizing a skin erythema dose. Faulty as it may be, the familiar table of Seitz and Wintz constitutes our best guide at the present writing, and is therefore reproduced here:

Skin erythema dose..................	100 per cent.
Ovary castration dose.................	34 per cent.
Sarcoma dose	60-70 per cent.
Carcinoma dose	100-110 per cent.
Rectosigmoid dose	135 per cent.
Muscle dose	180 per cent.

These authors consider the skin sensitivity as varying not more than ten to fifteen per cent.

Naturally one questions at once the possibility of a sarcoma or cancer dose being established at any given percentage of skin dose, not only on account of the inconstancy of the skin erythema as a standard, but also because of the long recognized difference in radiosensitivity of a lymphosarcoma, for example, as compared with a sarcoma of periosteal origin; and possibly the somewhat less variability in the reaction of the various types of carcinoma to radiation. Yet we must not pass over lightly the published results of the more important German radiologists which I have personally verified in scores of cases. Seitz and Wintz specifically state that they observe little difference between the response of carcinoma, whether scirrhous or medullary, possibly on account of the shorter wave length of the radiation they employ, though we have observed considerable difference in this country, employing radium, with its still shorter wave length gamma radiation. We must receive the Seitz and Wintz figures with some skepticism, therefore; yet to date their figures serve as our working basis, and we should not stint our praise of their work.

A big question mark stands opposite the proposition to administer the carcinoma dose within the shortest possible time. A wide divergence of opinion is noted on this point. Some of the leading German deep roentgen therapists urge that the entire dose be given at one sitting, or within two days at the most, the sessions totalling from nine to fourteen hours of actual subjection to radiation. Others, as Seitz and Wintz, administer the full treatment of pelvic cancer, for instance, in three carefully planned but intensive sessions separated by six to eight weeks' interval. Still others, notably Holzknecht and Groedel in Central Europe, and Béclère and Regaud in France, take issue with the intensive single session, massive idea. Regaud especially recommends much weaker doses (both of radium and x rays) extended over seven or eight days and believes that he and his associates have proved the advantage of this more deliberate plan. After as extensive observation as possible, both of my own work and the work of others, I choose to prescribe for my patients the full dose within the shortest reasonable time, considering the comfort of the patient, and endeavoring to complete the delivery of what we consider the probable carcinoma dose within four to eight days, including both x rays and radium when the latter is appropriate.

With the exception possibly of a few institutions richly supplied with radium, the attack on malignancy will probably be best accomplished by röntgen rays from the exterior and by radium from the interior (mouth, esophagus, vagina, uterus, rectum, bladder, nasopharynx, and such lesions as may invite the burial of radium emanation). Of course, time will tell; this paper is an attempt at appraisal. In this connection, permit me to invite your attention both now and in the future to the work of a very earnest group of investigators headed by Regaud at the Radium Institute in Paris, working in connection with Madame Curié and Béclère and Ledoux-Lebard, whose efforts, less widely heralded and exploited than those of the German schools frequently referred to, will throw much light on both the technical and biological aspects of radium and röntgenotherapy.

As to postoperative röntgenization, we must recognize that radium alone has not proved sufficient in the postoperative treatment of malignancies. All are familiar with the clinical results obtained in this country and the divergence of opinion so recently aired in an important conference of surgeons. Brunn after eight years and Wertheim's clinic after six years of experience in the postoperative use of radium for prophylactic purposes, realized that the local use of radium did not suffice. The reason is easily comprehended, fór unless one has enormous quantities available for external "radium packs," the local application must be inefficient at a few centimetres depth. The new röntgen therapy with super x rays permits a homogeneous radiation with a combination of internal radium and external röntgen application calculated to give the best possible protection against recurrence after operation. This postoperative irradiation would appear to be a matter of an intensive single session treatment (dose given within one to four or five days). And if the admirable work of Bovée is to be applied to therapy, is not the preoperative röntgenization placed on a more reasonable footing than ever before? Naturally, one hesitates to administer a full erythema dose to skin which must be incised within a few days, for fear of endangering the healing of the wound; but even if the dose of radiation arriving at the malignant tissue is not sufficient to kill it, the work of Bovée gives us ground for belief that we have inhibited the power of division of the malignant cells and materially diminished the danger of transplantation of malignant tissue during the operative procedure.

Röntgen intoxication (irradiation sickness) is one of the least serious complications of the newer deep therapy, though it stands out as one of the most disturbing to the patient. Headache, nausea, vomiting and weakness are fairly common in a greater or less degree, but fortunately the symptoms are transient and usually disappear within forty-eight hours at the most. Many patients suffer during the first of the applications and are not at all inconvenienced during the remaining two or more days constituting the session. The röntgen sickness is, like sea-sickness, not yet adequately explained. It is almost impossible to foretell who will be sick. Some go through the whole session without inconvenience, while others appearing equally able to withstand minor symptoms are woefully upset for a day or two. Occasionally (especially after long distance irradiation in breast cases) the röntgen sickness lasts for weeks and is very disturbing to the patient, though after all of minor consequence compared to the malady we treat. Various theories have been advanced to explain the intoxication, for such it seems to be, disturbance of the internal secretion of the ovaries, or other glands of internal secretion; toxins developed in the intestines, especially the jejunum and ileum; disturbances of the sympathetics in the splanchnic area; acidosis; vitiation of the air of the room; absorption of products of disintegration of the tissue under radiation; changes in the blood (Heinecke). To all of these suggestions one immediately thinks of exceptions; and attention to any one fails to do more than slightly lessen the discomfort. One naturally chooses for treatment work a well ventilated room with high ceiling; he adopts a system of high tension wiring which minimizes corona; he puts his current generating apparatus in another room; he encourages the patient's eliminative processes in every possible manner; sedative drugs may be employed to minimize the nervous or psychic factors; certain endocrine therapy may prove useful. The ordinary tests for acidosis (estimation of carbon dioxide tension of alveolar air, study of the urine and the chemical analysis of the blood) in our clinic have failed to show evidence of acidosis even in cases subjected to the largest doses we have dared to administer, or in patients exhibiting most distressing symptoms of irradiation sickness.

When treated for lesions about the head and neck, the patients often complain of temporary dryness of the mouth and throat but the symptoms seldom persist for more than a day. Patients with uterine, rectal, bladder or prostatic malignancy frequently complain of rectal and vesical tenesmus, best relieved by radiant heat applied locally, warm sitz baths and sedative drugs. Incandescent light treatment may be applied within the vagina with gratifying relief.

The great danger with the super x ray treatment is no longer that of irreparably damaging the skin, but rather one of insufficient doses. Malignant tissues rapidly acquire a tolerance to radiation, which emphasizes the necessity for the single session application. Insufficient doses of radiation will probably serve to stimulate the very process we combat; hence the necessity for adequate dosage. Fortunately the shorter wave lengths of x ray energy are much less likely to damage the skin. The difference in skin effect between a bundle of long wave length rays and short wave length rays, the dose being equal, lies solely in the difference of distribution of the absorbed dose in the two cases. With the newer therapy, the skin absorbs relatively much less radiation than with our older methods.

To repeat, the greatest danger is in insufficient doses. I have seen no severe skin reaction in any case subjected to the high voltage röntgenization either in my own work or in the foreign clinics visited. A few, astonishingly few at that, late severe reactions have been observed, but in the future we should be able to avoid them, especially if we persist in the single session, massive dose idea. In certain cases subjected to repeated treatments with high voltage apparatus, induration of considerable skin areas may appear. If treatment of these areas is continued, late ulcerations may develop. These indurations are likely to occur only in advanced cancer cases, and any means of relief is justifiable in such an extremity. The harder the ray and the more intensive the treatment, the less the danger of skin damage.

Serious blood changes have been mentioned as a danger and an objection to the new method. We have heard of blood transfusions as more or less routine procedure in some clinics in connection with the high voltage therapy as a means of saving the patient from the "terrific" effects of the irradiation. In our own work we have carefully and repeatedly examined the blood of our patients subjected to the heaviest irradiation but no serious changes in the blood have been noted. The hemoglobin and red cell count have dropped slightly, not over five per cent. on the average, and they have returned to normal within a few days. The leucocytes have shown a transient increase, followed promptly by a drop of three or four thousand with a gradual return in a few weeks to the normal figure. There has been no occasion for blood transfusion except in a certain number of patients coming to the clinic with malignant disease so far advanced as to render them cachectic. Such patients are not suitable for treatment, anyway, and heavy irradiation may actually shorten the life of one whose days are already numbered. Certainly the most marked blood changes which have been observed are not permanent and they do not constitute a contraindication to the treatment, save in very cachectic individuals, as noted.

Intestinal disturbances may occur, and they usually do when the small intestines lie in the zone irradiated; looseness of the bowels may be disturbing for a week or two, but the symptom is rarely a prominent one. A more significant sign, and one which gives encouragement by demonstrating that the dose has been actually delivered into the deep tissues of the pelvis, is the late appearance of varices or even ulcerations in the rectum and lower sigmoid, easily demonstrated by proctoscopic examination. These may appear months after the treatment, but respond to topical applications. Similarly, vaginitis may follow the treatment, even when no radium or intravaginal röntgen applications have been made. Such rectal and vaginal erosions and varices are especially likely to follow heavy doses with local radium applications, and often cause perplexity in deciding whether or not one has to deal with a possible recurrence.

Are we likely to encourage metastases by our efforts at deep röntgenization? Surely no more than by radium treatment, if indeed as much. The work of Bovée, already referred to, would contradict this idea. It may be that the excision of small bits of tissue for biopsy may encourage metastasis; we need more light on this question. Does a diagnostic curettage before irradiating a uterine mass add to the patient's danger of metastasis? One wants to use radium within the uterus in such a patient in any case. Dr. Wertheimer, of the Frankfurt Frauenklinik, recently investigated the frequency of metastases in carcinoma of the uterus, comparing unrayed cases with a similar series subjected to radiation. In over a hundred cases included in the statistics, metastases developed in 69.2 per cent. of the unrayed women below forty years of age, and in 48.6 per cent. above forty; in the rayed cases, metastasis was found in 63.6 per cent. below forty, and in 44.0 per cent. above that age. Statistics show, it seems apparent, that proper administration of radiotherapy does not increase the development of metastases. It is difficult to put a proper estimate on the value of these figures, for naturally only cases which did not do well under radiotherapy were included.

Here it seems appropriate to speak once more of the danger of an insufficient dose of radiation actually producing a stimulation of the disease we are fighting. One of the most prominent gynecologists of Berlin (very conservative on the new röntgenotherapy), after admitting that from ten to twenty per cent. of the inoperable uterine cancers were apparently cured after two years and some a little longer, remarked that in the postmortem room they were now seeing occasionally a case where, in spite of heavy röntgen and radium treatment, the patient had succumbed. In these autopsies they were now seeing much larger malignant masses than formerly were found in similar cases before the days of deep therapy. This suggests a stimulation of the process through insufficient doses delivered to all the malignant cells.

Once again let us consider the apparent successes. No one is yet willing to speak too loudly nor too hopefully; sufficient time has not yet elapsed. In one of the two best known gynecological clinics of Berlin, an avowedly conservative surgeon operates in all operable cases but admits ten per cent. to twenty per cent. apparent cures in inoperable cases. On the other hand, in Freiburg, Opitz, Kroenig's successor, will operate in no case of uterine cancer, no matter how early. Opitz gave us his latest figures on ninety cases treated exclusively by x ray and radium by the new technic since January 1, 1919. They are given here in tabulated form, group I being early, easily operable cases; group II, more advanced, yet still operable cases; group III, inoperable cases, on account of broad ligament extension, and group IV, the utterly hopeless cases.

SIXTY CASES OF CANCER OF CERVIX AND PORTIO.

Group	*No. of Cases*	*Apparently Cured*	*Uninfluenced*	*Patients Died*
I	4	4	0	0
II	13	8	3	2
III	39	18	9	12
IV	4	0	1	3
Total	60	30	13	17

THIRTY CASES OF CANCER OF BODY OF UTERUS.

Group	*No. of Cases*	*Apparently Cured*	*Uninfluenced*	*Patients Died*
I	10	10	0	0
II	9	9	0	0
III	8	4	2	2
IV	3	0	1	2
Total	30	23	3	4

The Erlangen statistics are even more optimistic than those just cited. Seitz also had declared his decision to operate no more in cases of uterine carcinoma, no matter how early, but this decision is by no means generally accepted throughout Germany. The more conservative ground, coinciding with my own, is to operate in operable cases, but to do so in connection with carefully planned preoperative and postoperative irradiation, combining both röntgen rays and radium, according to the case. We do not feel that we should abandon surgery for carcinoma in its operable stage until more time has elapsed to permit us to draw trustworthy conclusions from the foreign clinics where the experiment of exclusive irradiation treatment is nearing completion of its five year period of watching.

Surely we would be as blind as the proverbial "those who will not see," if we fail to recognize the tremendous extent and importance of the work that has been done. We have ourselves seen favorable results with the new super x ray never equalled before. Palliative results have appeared more promptly than ever in a large percentage of cases. Some have responded no better than before. We have no right yet to talk of results, but we do consider ourselves justified in expressing the encouragement we feel in going earnestly ahead with our work, and the high hope that some, at least, of the apparent cures will prove to be permanent. If the good results do not prove to be permanent, they will at least be much superior to any previous accomplishment in the radiation treatment of malignancy.

Splenectomy for Traumatic Subcutaneous Rupture of the Spleen

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The most frequent causative factor of a subcutaneous rupture of the normal spleen is severe traumatism to the left hypochondrium. This also obtains in spontaneous rupture of enlarged and diseased spleens although in the latter the traumatism need not be a severe one; a misstep, a slight blow or pressure from crowding, may be sufficient to rupture a distended capsule of a pathological spleen causing an exudation of the medullary pulp with attending hemorrhage. The severe traumatisms produce frequently at the same time complicated lesions which may involve adjacent organs. The character and the number of lesions depend on the nature, the direction of the force and the inflicting body.

The adjoining viscera which may be involved besides the spleen are the kidney, the left lobe of the liver, the greater curvature of the stomach, the base of the lung and the diaphragm. So we see, should any of these adjoining viscera be also involved at the same time, how the treatment of such multiple injuries may tax the resources of the operating surgeon. Therefore one ought to be sufficiently acquainted with the symptoms of lesions of the viscera situated in the left lower thorax or left flank to be able not only to diagnose but also to cope with conditions which may be met.

The indications for operative intervention in traumatic lesions of any of these organs are almost similar, but the nature of the operative procedures depends upon the organ involved and on the character of the lesion.

While considerable has been written concerning splenectomy for traumatism of the spleen every additional case may be not only of diagnostic value but frequently of aid in lowering the mortality in future similar cases. Recently I did a splenectomy for traumatic subcutaneous rupture in a child, the history of which is unique and the technic of the operative procedure and subsequent course of the condition interesting enough to be worthy of report.

Case.—The subject was a little girl eleven years old, who was admitted to my service in Lebanon Hospital on the evening of February 24, 1921, with a history of having struck a post four hours prior to admission, while bobsledding, injuring her left side. She could hardly catch her breath after the accident and immediately experienced severe pain over the lower left side of the chest anterior to the postaxillary line, and also in the upper left quadrant. There was no hemoptysis, but some pain on coughing. She vomited once after admission. There was no hematuria. She gave a history of having had a cough for about a week before she entered the hospital.

Her general condition seemed to be fairly good, although she was quite pale. The temperature was 98.8° F., pulse 78, and respirations 20. The eyes, ears, nose and throat were normal; the heart negative, and the lungs showed vesicular breathing throughout. There seemed to be a superficial friction rub over the left side about the region of the seventh and eighth ribs between the anterior and posterior axillary lines. Percussion revealed no abnormal dullness or flatness. The abdomen and chest showed no abrasions, but there was a noticeable resistance, especially at the upper left quadrant, in which region there was also considerable pain and tenderness. The liver was normal. The spleen was not felt and percussion over the organ showed no enlargement.

The next day the abdomen appeared slightly distended and this, with the partial resistance to the palpitating hand and pain and tenderness in the upper left quadrant, presented a suggestion of some peritoneal irritation. Although the pulse at this time was only 95, with no positive signs of internal hemorrhage, an injury of the spleen was nevertheless suspected, and orders were given to watch carefully for evidence of hemorrhage and that the pulse be taken every hour.

For twenty-four hours after admission there was practically no change in the temperature, pulse or respiration, and the rigidity in the upper left quadrant remained the same. On the following day, Saturday, February 26th, the abdominal distention was slightly more evident; there was tenderness over the left kidney region and left hypochondrium. The maximum tenderness was elicited on compressing the lower chest. Resistance over the entire abdomen was more marked, and the blood showed 3,500,000 red blood cells, 20,000 white blood cells, 50 per cent. hemoglobin, 98 per cent. polymorphonuclears, 10 per cent. lymphocytes, 1 per cent. transitionals. The pulse was 120, the temperature 100.8°, respiration 22. There had developed in the meantime an increased desire for water although there was not the slightest evidence of faintness or restlessness.

Operation was decided upon for the following reasons: Blood count, persistent rigidity in connection with pain in the upper left quadrant, tenderness and pain on pressure of the left lower ribs, evident distention, rapid pulse (120), pallor, nausea, suspicious dullness in left flank, and (what was of great significance in determining me to proceed) the nature of the injury in connection with these symptoms. Accordingly, at 8 p. m. under ether anesthesia, a vertical incision was made along the outer border of the left rectus which was later augmented by a transverse incision along the lower border of the ribs toward the left. On opening the abdomen there was at first no evidence of active hemorrhage, but on separating the coils of intestine fluid blood and clots began to appear. The spleen was immediately sought for and large clots were seen under the diaphragm and surrounding and covering it. On attempting to deliver the spleen active hemorrhage took place, and it was imperative to control the bleeding as quickly as possible in order to prevent an exitus. This was done by grasping the gastrosplenic ligament containing the vessels, with the fingers of the left hand until clamps were applied. The clots and the fluid blood were now carefully expunged and a better view of the parts obtained. A careful revision revealed several large and deep rents upon the surface of the spleen. The ligaments and adhesions were carefully ligated and broken down by finger dissection, and the lower and upper poles brought up into the wound. It was now seen that the organ had another large and deep tear running into the hilus which was covered by a large clot. The pedicle was ligated in two sections, and the entire organ delivered. The wound, after mopping and the placing of a small tampon on the oozing surface of the bed of the spleen, was closed in layers up to the gauze drain and dressing applied. The patient reacted very well from the operation, manifested a temperature of 103° on the evening of the second day, due to a postoperative pneumonia, signs of which appeared in the right lung. These signs gradually subsided to normal on the eleventh day, after which the little patient made an uneventful recovery.

Taking into consideration the extent and severity of the lesions in the spleen found at operation, the most interesting feature of this case was the comparative absence of symptoms of severe hemorrhage during the first twenty-four hours following the accident. In order to explain this condition one might assume that the adhesions present bound the spleen in such a way as to limit the flow of blood and thus favored clot formation, the gradual separation of this clot permitting a further active hemorrhage with all the evidence and signs of a continuous bleeding. That this assumption was correct was demonstrated by the large clot of blood found loosely connected to the spleen, after its delivery from the abdominal cavity.

Let us briefly survey the conditions which make it imperative to proceed with immediate surgical interference in lesions of the spleen.

Of first importance we would regard a subcutaneous rupture; secondly, penetrating wounds, such as stab or gunshot wounds, and, thirdly, traumatic prolapse or hernia.

Traumatic subcutaneous rupture is not an infrequent accident. Its symptomatology is not very exact, as the signs cannot be sharply differentiated from those resulting from injury to other abdominal organs, and to conclude that a rupture exists one must be supported by the evidence of two important factors, the first of which is symptoms of an internal hemorrhage and peritoneal irritation, and the second, a history of severe traumatism to the base of the thorax in the left hypochondrium, or in the left flank.

We would lay great stress on the importance of these two factors and regard them as the two cardinal points in making a diagnosis, and, furthermore, would not hesitate to state that if these two noteworthy facts can be elicited that they are more than presumptive evidence of rupture of the spleen, and therefore indicate the necessity of immediate intervention. Of course, the additional evidence of shock —collapse, rapid pulse, etc.—are also signs which would further aid and fortify a diagnosis. Sometimes a previous knowledge of the pathological conditions, such as a large malarial or leucemic spleen, is important in leading to a diagnosis, when a patient from a slight fall or blow over the splenic region shows evidence of an intraabdominal hemorrhage. Uncertainty as to the seat of the internal hemorrhage demands a median incision above the umbilicus and through this opening an effort should be made to discover by sight or finger the source of the hemorrhage.

As all the conditions with which it is likely to be confused demand operation almost as imperatively as does a rupture of the spleen, there is nothing lost by this incision. Convinced by the procedure that the bleeding arises from a lesion in the spleen, this median incision is not ample or convenient enough for further operative technic, and therefore it is better to augment this vertical incision by a horizontal cut from the upper, and generally parallel to the lower, costal margin towards the left. Retraction of this flap will give ample space for removal of the spleen should it be found necessary. At times even this flap will not suffice to bring down the upper pole of the spleen especially in cases where the dome of the diaphragm is unusually high, particularly when dealing with hemorrhage from large pathological spleens. When such difficulties present themselves it has been suggested to sever the cartilagenous ends of the ribs. This latter procedure will then give ample room and facilitates the removal of soft and friable spleens that are badly ruptured, and which tear and bleed so readily with the least manipulation. On the other hand, if in our preoperative diagnosis we are reasonably sure that the spleen is the affected organ, a better incision would be a vertical one at the outer border of the left rectus, commencing at the border of the costal cartilage, and, if the diagnosis is confirmed when the abdomen is opened, continuing from its upper end outward to the left across the thorax parallel with the borders of the ribs; then retract the flap, and should it be found necessary incise the cartilages. This latter incision gives a better exposure of the entire spleen and permits of an earlier approach for extirpation.

It is conceded that no matter how difficult it may seem to remove the spleen, or how formidable the hemorrhage appears, the safest procedure, if the spleen is found torn or ruptured, is to extirpate it. There is no alternative if the spleen presents a deep tear in one or more places and is bleeding actively. If the opening is sufficiently ample, the spleen not very hypertrophic and not very adherent, splenectomy will not be very difficult. When the abdomen is opened, the belly must be quickly emptied of the extravasated blood and the pedicle of the spleen immediately sought and grasped with the fingers; this offers a provisional ligature and prevents for the time being further bleeding until pedicle clamps can be applied. The spleen, after clamping the gastrosplenic ligament, the lienophrenic and lienorenal folds and separating other adhesions which may be encountered, is then delivered from the abdominal cavity, and its fanshaped pedicle cut closely to its hilus distal to the clamps. The stump is then ligated and, if necessary, its vessels individually tied. Instead of first applying clamps, a ligature with a ligature carrier may be passed through the gastrosplenic omentum and the vessels thus secured.

In those cases where it is found impossible on account of firm adhesions, and where the slightest attempt to separate these adhesions increases the hemorrhages from the spleen, or the condition of the patient is such that further operative procedure jeopardizes his life, tamponade is our *dernier résort.*

Should there be only a small and superficial rent which is easily reached, one may attempt to suture it with a blunt needle such as is used in suturing wounds of the liver, and thus may be able to stop the hemorrhage; however, on account of the friability of the spleen, favorable results are doubtful, and a happy outcome cannot always be expected.

When confronted with an abdomen full of blood, the result of a ruptured and actively bleeding spleen, one meets a situation that is most appalling. To one unacquainted with the technic of a sometimes very formidable operation, the situation is indeed dramatic, for we are dealing with one of the most serious catastrophes that can befall a human being, because the hemorrhage is sudden, in many instances very rapid and so severe that shock is overwhelming, and unless immediate operation is instituted, and one is prepared to cope with the emergencies which may be met, it quickly terminates in a fatal issue.

35 EAST SIXTY-FIRST STREET.

Atresia of the Anus, Rectum and Esophagus

By JOSEPH H. MARCUS, M.D.,
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According to Von Reuss, of Vienna, the following malformations occur in the region of the hind gut:

Atresia ani.—The anal membrane is closed by a membrane, the skin being either drawn tight over the anus, or in its place there is a shallow dimple or small fold above which the hind gut terminates in a kind of *cul de sac.*

Atresia recti.—The rectum is partially or completely replaced by a solid cord, the signal terminating at the sacrum or still higher up by an ampulla. In mild cases the atresia may be confined to a short band of tissue. With the pure form of atresia recti an external anus is present, but above the latter there is an obstruction.

Abnormal openings and communications.—In these malformations the rectum does not terminate at the normal place, but in the region of the urinary passages or the genitals, e. g., atresia ani vesicalis, atresia ani urethralis, atresia ani vaginalis, and atresia ani vestibularis. In the malformations mentioned above, in addition to the abnormal communications, there may be a normal orifice of the rectum. These malformations would then constitute fistulæ.

Atresia of the anus is obviously easy of diagnosis. The symptoms of complete atresia of the rectum are those of intestinal obstruction—complete constipation, vomiting, meteorism, visible peristalsis, etc. With a little observation it is comparatively easy to form a diagnosis. In a normal anal opening it is easy to palpate the blind end by digital examination of the rectum. The diagnostic difficulties are experienced if the atresia is very high up; examination with a bougie is at times a deceptive procedure. Abnormal communications and orifices may be recognized by the appearance of meconium or feces in the urethra or vagina, or in some part of the peritoneum, but the fact must not be overlooked that admixture of feces with the contents of the bladder cannot be found in every portion of the urine. The earliest possible recognition of atresia in the region of the hind gut is of the utmost importance, as in the majority of cases an immediate operation is the only means of saving the infant. If the sequelæ of intestinal obstruction occurs the prognosis is much worse. Von Reuss states further that it is only permissible to wait in atresia vestibularis and under certain circumstances in atresia vaginalis. We in the United States are accustomed to divide this type of malformation into three classes: 1, Complete closure of the anus with an entirely normal intestine above; 2, anus closed and in addition the rectum above it exhibiting atresia for a varied extent; 3, anus and part of the rectum immediately above normal but separated by a membrane from the patulous rectum farther up; the layer between the external integument and the blind rectum may attain considerable thickness.

Atresia of esophagus.—All authors agree that the most common congenital malformation of the esophagus is a combination of obliteration through more or less of its extent with tracheoesophageal fistula. Foreign contributors, according to Von Reuss, have reported over one hundred cases of atresia of the esophagus. In this country Griffith and Lavenson have found seventeen published cases since 1920. Von Reuss says: In a large number of cases there exists a communication with the trachea besides the occlusion of the esophagus. In other cases communication with the trachea is absent, there being instead a more or less long and solid central portion situated in the course of the esophagus. Occasionally the obliteration is so extensive that the esophagus appears to be altogether lacking; at other times there is only a thin membranelike septum (Marsh). Most rare is a connection of both esophageal segments with the trachea. Atresia of the esophagus is generally found in otherwise well developed infants whose external appearance immediately after birth presents nothing to attract attention. The characteristic symptoms appear only with the first efforts at taking nourishment. Swallowing is interfered with; after a few successive rapid swallowing movements the infant emits gurgling sounds as the fluid in the *cul de sac* gets into the trachea. Violent attacks of coughing and vomiting occur with threatening asphyxia. As a rule the children suck voraciously. As long as meconium is present in the intestinal canal, stools are passed by the infant, thus exhibiting nothing remarkable in this respect. As soon as the meconium is evacuated, either complete constipation follows, or there are, at most, scanty stools consisting of intestinal secretion. As a rule these infants die from inanition between their third and seventh day, exceptionally not until the second week; unavoidable pulmonary complications occur from aspiration of milk.

Similar symptoms may be found with cleft palate. There also may exist an esophagotracheal fistula with an otherwise normal esophagus and trachae; with the assistance of a stomach tube the diagnosis can be immediately established.

Case I.—P. S., male infant, was first seen on the day of his birth at the Atlantic County Hospital for the Insane. He was well developed and well nourished, weighing eight and a quarter pounds, and upon examination appeared perfectly normal, with the exception of atresia of the anus. Nothing had been given by mouth so there was no obtainable history of vomiting or regurgitation. Dr. H. C. Monroe, the superintendent, kindly volunteered the following family history. The child's mother, L. S., an Italian woman, married, thirty-nine years of age, was admitted to the hospital on January 2, 1919. Her husband was living and well, and there were three children, living and well. There had been no miscarriages or stillbirths; the youngest child was five years old and the oldest was twelve. Otherwise the family history was negative. There was no history of insanity in the family as far as could be ascertained. Physical examination was negative. The patient suddenly became insane in 1918, becoming violent and destructive; would wander away from home and refuse to go to bed at night. She was brought to the hospital on January 2, 1919, and upon admission spoke only Italian, incoherently; even an interpreter was unable to understand her. Was not orientated as to time or place. She refused to eat or to go to bed at night, but remained sitting beside the bed. Was always worried and tried to express a great desire to go home. She was paroled on October 2, 1921, and returned October 4, 1921. From this time on the patient was never troublesome, never expressed a desire to go home, and showed a distinct dislike for her husband. It was soon discovered that she was pregnant and on June 19, 1922, a male child was born; period of gestation, 260 days. Examination of baby showed atresia ani.

The baby was taken immediately to the Atlantic City Hospital and operated upon for atresia ani on the evening of the same day by Dr. David B. Allman. No anesthesia was used. An incision was made from the anus in the direction of the coccyx, the rectum then sewed to the anus and incised; a large amount of meconium was expelled and a catheter was inserted. The atresia found was of the second type mentioned by Griffith and Lavenson, in which the anus was closed and in addition the rectum exhibited atresia to some extent. After operation the baby was fed with a five per cent. lactose solution in sterile water. This food was retained for a few minutes when it was vomited; after a few feedings of lactose solution with the same result breast milk was obtained and fed with similar results. This attempted feeding lasted for twenty-four hours and suspecting an obstruction or atresia in the esophagus or stomach I passed a soft rubber catheter into the esophagus. Five inches from the lips an obstruction was met with, and being unable to pass the catheter further down into the stomach a hard silk fibre catheter was used with the same result, a similar point of obstruction being encountered. The presence of atresia of the anus and rectum, the vomiting and the unsuccessful attempts to pass the catheter into the stomach pointed to an obstruction in the esophagus, and judging from the usual condition in these cases, there was presumably an obliteration of the esophagus in the lower portion. Operative procedure was decided upon. The patient was anesthetized and before the abdominal incision was made a catheter was introduced into the esophagus, but encountered the same obstruction. An abdominal incision was made and the stomach exposed, which was found to be normal in size and appearance, and no tumor or thickening was felt at the pylorus. An incision was made through the anterior surface of the stomach, and no trace of food being found therein, Dr. Allman passed a catheter through the incision attempting to pass through the cardiac orifice, but met an obstruction. A tube was inserted into the opening to the stomach and sutured and 150 c. c. of normal saline solution was introduced into the peritoneal cavity. Rectal feeding and salt solution were given which only postponed the fatal issue which occurred three days later. The atresia of the esophagus commenced at a point approximately one and a half inches from the cardiac end of the esophagus.

Editorial Articles

PROHIBITION

The Volstead Act is a good thing. The Volstead Act is a bad thing. It has brought better health and larger bank accounts. It has increased drunkenness and crime. One can get any statement and any set of figures he chooses on this subject, provided he goes to the right source. Truth about the matter seems certainly most Einsteinian. There has been no prohibition of prejudice from habit and custom, and no abolition of financial and political bias.

The word abolition reminds us that there is an amendment to the constitution aimed at bringing about prohibition of slavery, but slavery exists on a large scale as it did before this amendment was passed. Not negro slavery, it is true, but slavery of men of all colors in industry, a slavery which, through the struggles of labor organization, we are gradually getting rid of as we outgrow slowly our inborn appetite to exploit others for our own gain.

The prohibition act has rid us of the curse of saloons, just as that other amendment rid us of the curse of negro slavery, but we are not at all rid of alcohol nor of its private consumption. The act has abolished the chief source and emblem of intemperance, and the amount of alcohol consumed must be greatly decreased. There is no running from one corner saloon to the other three and no treating until the week's earnings are consumed.

There has been much propaganda based on the assumption that alcoholic drinks now sold are of a more dangerous quality, but we do not know of a time when it was not commented that the alcoholic drinks sold in saloons to the average man were of the socalled fusel oil and rot gut variety. The thirsty are, however, now made aware of the bad quality of the stuff they may buy from the bootlegger, and this has added some effectiveness to the prohibition law and reduced the amount of alcohol consumed.

For some decades previous to the passage of the Volstead Act there had been a decided decline in intemperance, especially among workmen of certain industries in which alcoholism was notorious. Just why, we do not know, though, doubtless, better wages, better living conditions, and other sources of pleasure had much to do with this. The change was noted by the larger visioned men in those industries, and the decline in mortality, especially from tuberculosis, which accompanied this decrease in intemperance, would be explained both by the actuary and the workman himself on no other ground than by a relationship between the two. This tendency to temperance continues, even if it may have had a slight setback by the feeling of antagonism to the prohibition law as it stands. The tendency to temperance continues, but total abstinence is quite another matter and as yet is so far in the future for a large mass of the population that it cannot be enforced, and a law that cannot be enforced to a fairly high degree is worse than no law. No one wants to go back to the socalled good old days of the bar room and saloon, but no one should want a law which is so inclusive as to be out of harmony with the natural appetitive law of human conduct as it exists at the present time.

THE NOISY OFFICE

The New York Medical Journal on several occasions has pointed out editorially the industrial menace of noise. There is no doubt that while the human organism may become habituated to the din of machinery, that constant exposure to auditory stimuli exercises a deleterious effect upon the nervous system. This is even more pronounced in the case of brain workers who must concentrate to greater degree upon their work than the manual laborer. Ideation is slower and the finished product less accurate in an environment of gnashing adding machines, pealing telephone bells and rattling typewriters. Leather lunged Stentors rend the air with telephone conversations and, the pest of pests, the gabby officemate reduces the output of exact work. These interruptions make it necessary for the mind to switch on and off the target and, since the inertia of rest must be broken each time the continuity of effort is checked, the load which the human machine carries is thereby greatly increased. Is it any wonder that office workers as a class are more likely to have a subnormal state of nervous health and a shorter life span than does the group which labors in relatively quiet surroundings, when the greater strain to which they are subjected is considered? If it is necessary that the directing heads of large businesses be officed in sound proof, silent rooms, how much more is it requisite that the stenographer, the clerk or the proofreader have the benefit of a hushed office in which every sound is cut down to the irreducible minimum.

Anyone who has traveled widely must have been struck with the fact that the lower the civilization of a people, the more they indulge in purposeless noise. It is true that they have no pneumatic riveters, roaring airplanes or screeching steam whistles, but the amount of entirely useless chattering, pounding and vociferation which can go on in a native village is almost unbelievable. Their mental life is on a very low and narrow plane and concentrated thought, such as is required for creative effort, of rare occurrence. It is only when man reaches the higher levels of civilization that a definite effort is made to eliminate noise. Measured by this standard many of our offices are still pretty far down in the development scale.

It is well worth the effort of those who administer offices to hang out the SILENCE sign and to undertake careful studies with the view of reducing the tumult in which many people are obliged to work. It is surprising how many sounds may be gotten rid of by proper office discipline, how easily a quiet telephone voice, far more effective than trumpet tongued bellowings, may be cultivated, how much peace may be engendered by rubber castors, quiet typewriters and padded adding machines. Every sound eliminated increases the general efficiency of the office force and best of all there will be a coordinate improvement in its mental health.

PREVENTIVE TEACHING AND PRACTICE

The teaching and practice of medicine and surgery, of course, especially of medicine, seem to be pointing more and more in the direction of prevention. Sanitary measures efficiently carried out, aided in some instances by other protective methods, have resulted in the virtual abolition of the epidemic diseases which used to take heavy toll of the population in civilized countries formerly. But environment is still responsible in industrial countries for a great deal of avoidable sickness and for many deaths which might be prevented. In the big cities of this country, there are large slum areas in which people live under conditions which are not only bad for the dwellers themselves but are a menace to the entire community.

It appears to be often forgotten that there are certain diseases which are engendered and fostered in the tenement districts of large centres of population which can be easily transmitted to persons living outside these districts, and that therefore it is advisable for the sake of the whole population that such pest spots and sources of danger should be eradicated. The president of the British Medical Association for this year, who, by the way, is a surgeon, devoted his presidential address to a consideration of the effects of environment upon health and urged eloquently that from the point of view of economy, the question of dollars and cents sometimes moves hearts when other pleas fail. It would be to advantage of all concerned, even of the taxpayers, if dirty, dark, unhealthy houses were cleared away and in their place there were erected, light, airy, sanitary and hygienic dwellings.

The annual report of the London Metropolitan Asylums Board which has just been issued adds weight to the above argument. It reveals the facts that in the year ending May 31st last a sum of $11,756,840 was spent on the treatment of fevers, smallpox, mental deficiency and tuberculosis. Fevers and smallpox accounted for more than half of this outlay, and it is pointed out that in the case of smallpox most of, if not all, this outlay might have been prevented if vaccination had been carried out as it should have been. Vaccination in Great Britain has fallen largely into disrepute, because any persons who wish can evade it for themselves and family by claiming exemption as conscientious objectors.

This too emphasizes what was said previously in this editorial that by neglecting preventive measures which have been proved effective, disease may be and often is spread far and wide and among the innocent and careful. For example, the citizens of London have had to pay for the negligence of some of their number in the matter of vaccination and the inhabitants of other cities may well be invited to ponder over and realize this fact. The situation with regard to the other fevers is different.

The cause or means of transmission of scarlet fever is not known, nor is the cause of measles. These diseases together with diphtheria are responsible for the greater part of the expenditure in London. These diseases fluctuate in their occurrence or recurrence. Sometimes they are quiescent and sometimes they rage. Such fluctuations are little understood but the view that this increase of infectivity is fortuitous is no longer held. No doubt some laws of a definite nature are in operation. Epidemiologists are grappling with this phase of the question at the present time and it is to be hoped that ere long the obscure points will be cleared up when it will be possible to anticipate and avert the disastrous sequels. Experiments in this direction are now being carried on here and in Great Britain and it is a branch of preventive research of the utmost importance.

To return, however, to the matter of disease and environment, there are two diseases which are influenced profoundly by environment, tuberculosis and rickets. Where there is plenty of light and fresh air, both tuberculosis and rickets are rarely met with. These maladies are more affected by environment than any disease, although rickets is probably as much affected by diet as by environment. Yet by the tearing down and clearing away of tenement districts, particularly in New York, and by building houses well lighted, well ventilated and hygienic in every respect, a longer step would be taken towards eradicating tuberculosis and rickets than any possible to be taken.

It is now a truism that public sanitary measures on a large scale have almost exterminated the big epidemics in civilized countries and the object of preventive medicine is now by providing good houses and by education in domestic hygiene to prevent tuberculosis and rickets, the two most crippling diseases known, one of which is the most deadly of civilization, from originating or, at any rate, from developing, as well as to prevent many diseases which are initiated and flourish in dark, dirty and unhealthy environment. Light is the greatest enemy of most diseases and where there is light there is generally health. Diet plays a leading rôle in the production and maintenance of good health and is therefore an essential link of the chain of health. The food eaten by the American people is generally speaking of good quality and generous perhaps, usually too generous in quantity. However, too much pappy predigested food and too much canned food of every description is eaten. Preventive surgery also is forging ahead but the subject cannot be dealt with in an editorial and it must suffice to say that early diagnosis and prompt and skilful surgical measures, as in the treatment of cancer, will often nip in the bud what otherwise might have developed into a serious or fatal disease. The prevention of disease is the truest economy and consequently, however much the primary cost may be, the clearing away of slums is the truest economy. Money properly expended in the prevention of disease is always money well spent and will repay an incalculable amount of interest on the original outlay.

EATING TOO MUCH

A large number of people have dug their graves with their teeth and many are still digging their graves in this manner. Even children who can, of course, consume much more proportionately than adults and flourish, frequently eat a great deal more food than is good for them. A mother is inclined to plume herself on the fact that her infant is continually or almost continually taking nourishment and is surprised that it is peevish and does not seem to make progress. Dr. Eric Pritchard is one of those who have preached in and out of season that infants are often stuffed with food to their lasting detriment by their mothers or by those who have charge of them. While much is heard and written concerning deficiency diseases, and rightly too, little is heard of the diseases consequent on or aggravated by overeating, among both children and adults. There are agents without which we cannot live which at the same time may kill in excess.

A well balanced diet in sufficiency is needful for health but such a diet taken in excess during a prolonged period may easily be highly injurious and in time kill. In hot weather and so far as infants and young children are concerned this is especially the case, and in those fed artificially the fat in the milk may be reduced with benefit. We cannot live without some sugar in the blood, but too much constitutes disease, and the suggestion has been made that diabetes, owing to the system being unable to produce insulin for itself, is brought about by excessive activity, whereby the particular cells in the isles of Langerhans in the pancreas, whose function it is to supply insulin in proportion to the demands made upon them by the diet become exhausted, or, at any rate, impaired so that they cannot provide insulin in adequate amounts.

All diabetic individuals do not necessarily consume to excess starchy and sugary foods; in the chronic diseases each person has probably a predisposition to one or other disease, but the contraction of diabetes does suggest the results of excess in relation to the particular capacity of the cells of the islands of Langerhans of the person afflicted. Thus diabetes is more prevalent among the rich than the poor and, to a certain extent, may be termed a dietetic disease.

In a similar way many of the chronic diseases may be termed dietetic diseases, in the sense of overeating. By continually overstraining the digestive organs by eating unsuitable food to excess, alimentary toxemia is produced, which directly or indirectly causes or intensifies various diseases. That dietary excess is responsible for many diseases and conditions of ill health seems to have been plainly proved by the experience of the war. In all countries and especially in Germany and Austria there was and is in these latter countries, a marked reduction in certain forms of disease associated as to cause with overeating. Diabetes, renal disease, and arterial degeneration have been reduced among the formerly prosperous selfindulgent inhabitants of Germany and Austria, although it is true that the lean diet has increased the prevalence of rickets and tuberculosis in childhood. The increase of cancer among civilized people and particularly among prosperous high living people, gives one to think furiously and to help the belief that after all cancer is a disease of civilization.

The state of affairs with regard to cancer in this country—it is increasing—and the death rate from it tends to suggest, to put it mildly, that cancer is a disease of civilization, that is a disease chiefly affecting a well to do people who eat generously, perhaps too generously. This is a prosperous country, a sanitary country and a clean country, and one in which the general standard of living both as regards housing and food is the highest of the world. And yet the cancer death rate is very high and rising rapidly. As said before, the standard of living regarded from every point of view is extremely satisfactory, and with the exception of a perhaps too liberal diet on the part of the population at large

There absolutely seems to be no reason why malignant disease should be so prevalent and deadly. Is overeating the physiological sin of the citizens of the United States, and is cancer initiated or developed or both by errors of diet in quality and particularly in quantity in those who are predisposed to the disease? The prevalence of cancer in prosperous countries in which the people eat largely is so suggestive that the problem should be closely studied from the viewpoint of civilized life and particularly from the point of view of diet. Eating to excess may be the cause of more disease than is imagined and in suitable food eaten with discretion may be found the master key of preventive medicine.

TROPICAL DISEASE RESEARCH

Research in tropical diseases has developed and is proceeding apace. Now that the uninhabited spaces of the earth are becoming fewer, and the industrial countries are becoming more and more over populated, tropical lands are being looked to as havens for a part, at least, of the superfluous white race populations. Indeed except for their unhealthiness, so far as the white man is concerned, the lands of the torrid zone present many attractive features to settlers of the Causasian race. They are fruitful, generally speaking, when the land is cleared, the soil only needs to be tickled with a hoe and it will laugh with a harvest, but as said before the tropics not only tend to undermine the health of white people but are infested with diseases to which these are peculiarly susceptible and which are much more deadly to them than to the natives.

Doubtless the skin pigment has much to do with the susceptibility and comparative immunity, and it may be true as is thought by some that the white man can never be so immune to the climate and diseases of the tropics as the black man. On the other hand, by taking due precautions, the fair skin immigrant is able to protect himself against the climate, and if it were the climate alone he had to fight, this would not prove an insuperable barrier to a fairly healthy and comfortable sojourn in the tropics. It is certain diseases of the tropics which are so destructive to the life and health of the white man and, to a lesser extent, to those of the black man.

If some diseases were absent life in the tropics would be, for all, divested of many of its terrors. Already the results of tropical research have been so successful as to lead to the hope that if such research is pursued persistently, patiently and under the most favorable auspices that the most menacing tropical diseases will be robbed of their sting, if not wiped out altogether.

A beginning in this direction has been made in the instance of malaria, on the whole the most injurious disease to health ever known. Its mode of transmission to man has been discovered and with it the most effective methods of preventing it and perhaps, in time, of eradicating it from the face of the earth. The discovery is the greatest triumph of tropical research and perhaps of all medical research. It has opened up lands before closed to human beings and has rendered possible important works in tropical regions which before the discovery had been impossible. Witness the Panama Canal.

The discovery pointed the way to discoveries of a like nature, for example that of the transmission to man of yellow fever by a mosquito, the result of the selfsacrificing work of the American Yellow Fever Commission appointed in 1900, consisting of Reed, Carroll, Lazear and Agramonte. It will be futile to attempt to point out in the course of an editorial, the discoveries made with regard to parasitic and insect-borne diseases. It must suffice to say that the importance of the study of parasites in relation to human disease to mankind in every part of the world, even in those parts free or comparatively free from parasites, is becoming daily more obvious.

Such diseases as kala-azar, sleeping sickness or plague have more than an academic interest for civilized people and especially for Americans, irrespective of the fact emphasized in a former part of this editorial, that their presence and prevalence largely aid in deterring white men from living in and making full use of the riches of the tropics for the benefit of mankind at large. The importance of parasitic diseases is of much wider scope on account of the modern facilities for communication and owing to the extent of foreign immigration. These conditions have brought distant regions together in such a way that things which affect one part may easily affect another remote part. And further this country is especially prone to the importation of tropical diseases because of its large immigration from tropical lands.

It has been stated in a recent edition of Asa C. Chandler's work on animal parasites and human disease that in the port of San Francisco alone over fifty per cent. of 6,428 Orientals whose feces were examined in the course of a little over two years were infected with hookworms and according to Dr. Billings, U. S. Immigration Service, in 1911 about ninety per cent. of all Hindus arriving were found to be infected with hookworms. Therefore it is plain that the possibility or probability of other diseases becoming established in places not before troubled by them is a subject of vital importance to any community or nation, and for the reasons stated to this country in particular. It may be remarked that some of these diseases have become established already in places which were formerly free. However there is no need to elaborate the point that tropical diseases affect and are a matter of concern to white people living in civilized countries and that tropical research consequently should be encouraged in every possible way. Unfortunately this has not been the case, and workers in tropical research, as a rule, have had to contend with difficulties of every kind, not the least of which has been and is the lack of funds.

The great object lesson of tropical research is Ronald Ross's epoch making discovery that malaria is transmitted to human beings by the bite of the anopheline mosquito. It has been proposed recently in Great Britain that the twenty-fifth anniversary of this discovery should be marked by the erection in London of some fitting monument in commemoration of his achievement. There is in process of organization the nucleus of an institute which it is suggested should be called the Ronald Ross Clinic for Tropical Diseases and Hygiene, in which it is proposed that laboratory research and clinical investigations should be combined as closely as possible in accordance with his teaching. In Great Britain this proposal is earnestly advocated by statesmen, well known men in various branches of endeavor, and by the leading physicians and surgeons, by the Surgeon-General of the Italian Navy, by Dr. P. P. E. Roux, Director of the Pasteur Institute, Paris, by Dr. Richard Strong and Dr. William H. Welch, of Johns Hopkins University, by Surgeon-General Hugh S. Cumming, Public Health Service, U. S. A. Medical science knows no boundaries and he who discovers and shows the way to the prevention of a disease is not so much a national benefactor as a benefactor to all mankind. Ross may be placed in this category; the result of his investigations has been the saving of millions of human lives and much suffering with the promise that the most devastating disease ever known may be done away with. To say that no monument can repay the labors of such a man is to put the situation baldly. But it is right to say that if a monument is to be erected, the one proposed is the most fitting.

SEX EDUCATION

Man passes, in the course of his existence, through two very distinct and very different periods—the asexual life and the sexual. The statement of this fact is trite and its acceptance in theory is unquestioned, but its practice is, or has been, nearly nonexistent. Moreover its lack of application is a source of grave evil to society. The reason for this is that, after man has passed from the first into the second stage of existence, from the asexual to the sexual, he forgets entirely the life he led in the first period, and cannot retroject himself to the mental atmosphere and mental outlook of his prepubertal career.

Before puberty the child has no genital sexual appetites or appetencies. He may be told or may read anything about sex, and, aside from furnishing him with information, it otherwise rolls off his mind like water from a duck's back, for there is no means for its entrance. The young child is, however, like all animals, curious, and he inquires as to his whence and how. If told, at this time, the plain, good and beautiful truth about his coming, he takes it as a matter of course and the information is pigeonholed where it belongs and in its proper order. There is no commotion in his brain or bodily mechanism. The knowledge came when it was wanted and needed. If the knowledge of his origin is withheld or falsified, there is no such mental fulfillment and seeds are laid for trouble because he must then get the truth from bad sources and at a delayed date.

Most parents do not give a truthful statement to the prepubertal child's inquiry and the reason is that, after the development of the sex life, there is, as we have stated, such dominance by sex that the appreciation of one's own age of innocence and of innocent desire for truth is so nearly lost that we are afraid we are going to do some awful damage to the child mind by giving that which, at the time, can by no possibility injure him. This fear of truthfulness is accented also by the source from which the parent usually acquired, too late, the little knowledge he had of his origin.

The whole bugaboo of sex education lies in this loss, by adults, of the attitude of the child mind and their total inability to retroject themselves and to converse in a sane, wholesome, and truthful manner about the most wonderful and beautiful thing in life. When it comes to children beyond the age of puberty the same straightforward truthfulness cannot harm, because the truth is bound to be learned, and the more simple and direct the route the better, and from the wiser sources the better. There really is no bugaboo about sex education except that which we create within our own ill taught, near sighted, tainted, adult mind. Except they become as little children, the parent and the teacher are not likely to enter, with the child, the kingdom of heaven. They are more likely to land in hades.

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News Items.

Oral and Plastic Surgeons to Meet.—The third annual meeting of the American Association of Oral and Plastic Surgeons will be held in the Rose Room, Congress Hotel, Chicago, Ill., Monday and Tuesday, October 22d and 23d. An interesting program has been arranged and those interested in this field of surgery are cordially invited to be present.

Post-Graduate Medical School Lectures.—The New York Post-Graduate Medical School has arranged a course of lectures on phases of medical practice of current interest, to which all members of the medical profession in New York and vicinity are invited. The lectures will be given on Friday afternoons at five o'clock. Further notice of the exact dates and subjects of these lectures will be mailed to any physician who will send his name and address to the Dean, New York Post-Graduate School and Hospital, Second Avenue and Twentieth Street, New York.

Southern Medical Association Reunion.—During the meeting of the Southern Medical Association it is hoped that the Alumni of each of the Medical Schools represented will meet together at dinner. The evening of Wednesday, November 14th, has been set apart for that purpose. The Committee desires to know approximately the number of diners to be expected at each of these reunions. Those who expect to attend should therefore notify Tom A. Williams, Chairman Alumni Diners, Southern Medical Association, 1746 K Street, Washington, D. C., by the end of October.

Whooping Cough Mortality Rates.—The relatively high mortality from whooping cough during 1923 to date, following the lowest rate ever recorded in 1922, shows startling contrasts in its mortality incidence when compared with the three other epidemic diseases of childhood—measles, scarlet fever and diphtheria—according to the Metropolitan Life Insurance Company, which has just completed a survey of whooping cough conditions. Whooping cough is the only one of these four diseases which kills more girls than boys; which has a higher death rate among negro children than among white, and which causes more deaths among children in the rural districts than in the cities. In 1917, the whooping cough death rate in the cities of the registration states was 9.4 per 100,000, while that for the rural part of these states was 11.6. Similarly, in 1916 the urban rate was 9.7 and the rural figure 11.4. For 1915 and 1914, the urban figures were 7.9 and 9.2, respectively, while those for the rural areas were 8.6 and 11.4.

Dr. McGrath Back From Cancer Study Abroad.—Dr. John J. McGrath, president of Bellevue and the Allied Hospitals and also a visiting surgeon at these institutions, returned from Germany on the Resolute of the United American Lines after spending two months at clinics in Hamburg, Berlin, Frankfort and Leipzig. Dr. McGrath said that his object was to study the advances accomplished by notable German physicians in the treatment of cancer. It is planned to establish at Bellevue Hospital a department of radio therapy where the most modern methods of treatment of cancer by the x ray and radium will be installed so that sufferers from this disease who apply at Bellevue and the Allied Hospitals, especially those without means to pay for private treatment, may receive the benefit of free treatment. Dr. Arthur S. Unger of 35 West Seventy-fifth Street, who has successfully treated cancer with x ray and radium, accompanied Dr. McGrath on his trip to Germany and returned with him on the Resolute.

Chicago Menaced by Goitre.—It has been conservatively estimated that Chicago has 200,000 persons suffering from preventable goitre, the greatest number of cases occurring in persons between the ages of birth and sixteen years. Seventy-five per cent. of goitre is among school children.

Less Scarlet Fever This Year.—Scarlet fever has shown a marked decrease this year, according to health commissioner's reports. During the past six weeks no deaths had been reported from this disease. Since January 1st to date 6,832 cases have been reported, compared with 8,622 cases during the corresponding period last year.

United Hospital Fund Annual Report.—The administration costs of the fund hospitals for the year were less than seven per cent. of the total income, reports the secretary, Frederick D. Green. This was possible because of the tremendous amount of free service given by physicians and other hospital workers. The largest item of expense is the free care of the sick poor.

Foreign Urology Conventions.—The Sixth Congress of the Spanish Associacion de Urologia will be held at Madrid, Spain, on October 17th. The two main topics for discussion are Hypogastric Cystoscopy, to be presented by Dr. Camina Bilbao, and Indications for Operative Treatment of Calculi in Kidneys and Ureter, to be presented by Dr. Miraved of Madrid. The Twenty-third French Urology Congress will meet at Paris on October 10th. Dr. Andre will preside.

Dr. Mayo Predicts Longer Life Span.—The average life of the human being has been prolonged from twelve to fifteen years as a result of recent advances in medicine and surgery, Dr. Charles H. Mayo of Rochester, Minn., declared at the meeting of the Manitoba branch of the American College of Surgeons. Dr. Mayo predicted progress already made would be surpassed in the years to come. He emphasizes the need of education as the prime requisite in the battle against disease.

Eye Clinics Save Sight of Children.—The Bureau of Child Hygiene operates ten eye clinics which gave 85,000 treatments to 25,000 school children last year, the health department reports. This included 10,000 examinations and treatments at sight conservation clinics to candidates for sight conservation classes. In 1922, 36,000 refractions were performed by ten oculists, who wrote 11,000 prescriptions for glasses. Much refraction on mentally backward and very young children is done by skiascopy or the shadow-test.

New Magazine in Health Field.—In an attractive new dress, in a more compact and readable form, the most recent number of "Venereal Disease Information," a monthly publication issued by the United States Public Health Service at Washington, has just come from the press. This magazine is intended primarily for health officers, physicians, nurses and social workers engaged in venereal disease control activities. The present issue contains several special articles, among which is one on general paresis. The subscription price for this new periodical is fifty cents per year, payable to the Superintendent of Documents, Government Printing Office, Washington, D. C.

VIENNA LETTER.

(From our own correspondent).

Vienna, *June 23, 1923.*

SUBSTITUTION NOT PROSECUTED.

It is not often that the courts are called upon to decide on the merits of a case of substitution of drugs in dispensing prescription, despite the great scarcity of some medicinal and food preparation, and also despite the exorbitant prices which are prevalent in the present unfortunately low exchange value of the depreciated Austrian currency. If, however, such cases occur, luckily enough, very infrequently, the courts are not asked to assess damages for injuries received from such substitution, the public being used to get substitutions from war time.

A case has, however, just been decided in the High Court of Justice of Vienna in which a patient unsuccessfully took action against a drug company for substituting cocaine for novocaine in the dispensing of a prescription. It appears that the patient, who was known by her family physician to be especially susceptible to the influence of cocaine, was ordered by him a proprietary mixture containing one centigram of novocaine to each dose. The druggist not having the mixture ordered, substituted another, containing half a centigram of cocaine to each dose. As a result of taking the medicine, the patient suffered from acute cocaine poisoning, which reacted seriously on her state of health. The judge who heard the case took the extraordinary course of accepting the opinions of the person who dispensed the medicine as those of an expert witness, although he had no scientific or medical training and on his evidence alone decided to dismiss the case stating that there was no evidence of an excessive dose of cocaine having been administered. Had such a case found its way into the court before the war, the druggist would have surely received a different kind of consideration.

THE VALUE OF KOPLIK'S SPOTS IN EARLY DIAGNOSIS OF MEASLES.

In a recent issue of a medical monthly Dr. Narratil says that he had looked for the spots on the buccal mucous membrane, first described by Koplik as preceding by some days the general eruption of measles, and he had found them in twenty-four cases. In one case they preceded the eruption by six hours, in eleven cases by twenty-four hours, in three by thirty-two hours, in four by forty-eight hours, in two by three days, and in two by six days. The spots were generally situated on the mucous membrane of the cheeks opposite the molar teeth, but occasionally also on the lips, beginning as slightly raised, bluish white, circular, sharply defined points, in size less than a pin's head, and surrounded by a narrow red areola. In a few days they generally increase slightly and become more prominent and the areola enlarges and becomes irregular in outline. Their number varied between six and twenty, and the time during which they persisted from two to six days. They were most marked just before or at the time of the general eruption. They were not present in fourteen cases. Since they are never seen in other conditions accompanied by fever, they become of the greatest importance for the early diagnosis of measles. Narratil claims that the buccal eruption in measles was first mentioned by Gerhardt, and that their importance was recognized by Filaton in 1895, a year before their independent discovery by Koplik.

THE HEART IN TUBERCULOSIS.

In the Vienna Medical Society, Dr. Herz, lecturer on diseases of the heart in the University of Vienna, said that since the announcement by Rokitansky, in 1846, of the theory of the supposed antagonism between valvular heart disease and pulmonary tuberculosis, many observers have sought to bring forward clinical evidence in its favor. It is generally believed, that valvular disease affecting the left side of the heart has a more or less retarding influence upon the progress of chronic phthisis, or even that individuals so affected are to some extent exempt from the attacks of the tubercle bacillus. The explanation which has been offered for this antagonism is that a sort of immunity is conferred through the venous stagnation and consequent chronic congestion which is maintained throughout the pulmonary circulation. That this socalled immunity is by no means absolute, nor, indeed, constant, is proved by the fact that the concomitance of the two affections not infrequently occurs. Dr. Herz has found that smallness of the size of the heart, which was at one time thought to be an important predisposing cause of tuberculosis, is generally discovered at the postmortem, as ably described by Dr. G. S. Norris, of Philadelphia; but Dr. Herz considers that this may be equally the result of the generally impoverished condition of all the bodily tissues. On the other hand, patients suffering from pulmonary stenosis are exceedingly prone to contract phthisis, and this is not surprising when it is borne in mind that this particular cardiac lesion is frequently associated with congenital abnormalities which do not improve the general poorly aerated condition of the blood. Actual tuberculosis of the heart itself is decidedly rare, but it has been estimated that some degree of tuberculous endocarditis is met with in something under five per cent. of all cases of phthisis submitted to an autopsy. Degeneration of the cardiac muscle commonly occurs in pulmonary tuberculosis, which probably accounts for the failure of digitalis in many cases.

EARLY DIAGNOSIS IN MENTAL DISEASES.

At the recent meeting of the Vienna Interhospital Medical Association, Dr. T. Gaspari introduced the subject stated above. He defined insanity, according to Burr, as a "prolonged departure from the individual's normal standard of thinking, feeling and acting." A comprehensive definition would include mental defect from whatever cause, and mental perturbation of whatever degree. Any or all of the elemental processes of sensation, perception, ideation, reasoning, judgment, memory, may be impaired in insanity. In his paper, the nature and degree of impairment of these elemental processes and of emotion and volition in different forms of insanity were touched upon. Subjects discussed at greater length were the distinction between confirmed inebriety and true insanity of alcoholic origin; the differential diagnosis of alcoholic pseudoparesis and paretic dementia; certain phases of hysteria, and the diagnostic difficulties pertaining to paranoia and recurrent mania. Neurasthenia was a euphemism often employed to obviate the necessity of plain speaking, or might be used erroneously to explain symptoms in the early stages of an organic malady. The selfdeception on the part of the physician or his inaccuracy in diagnosis led to improper methods of management, and the prescription of travel often made for such patients was deplored and incidentally hospital care for neurasthenic cases was advised.

PREVENTION OF HEART DISEASES.

Dr. Arthur Hasenfeld, lecturer on heart diseases in the University of Budapest, delivered an address on this. He discussed in what manner the principles of prevention could be applied to various heart affections. He regarded the removal of all chronically diseased tonsils (this was first recommended by Dr. R. Babcock, of Chicago,) as of the utmost importance in all persons who had once had an attack of inflammatory rheumatism, whether the heart had been damaged or not. If infection could be prevented, cardiac inflammation could likewise be obviated. This statement applied to affections other than rheumatism. He then mentioned syphilis and gonorrhea, saying that these diseases sometimes attacked the cardiac structures. Pneumonia, chorea, and scarlatina are sometimes accompanied or followed by acute or chronic endocardial mischief, while influenza or diphtheria may attack the myocardium in an inflammatory way, so as seriously to impair its integrity. Until we could prevent such infections, we could not guard against the cardiac structures being attacked.

The author discussed chronic myocardial diseases, the toxic influence of syphilis, alcohol, and chronic lead poisoning, fatty heart, and particularly cardiac overstrain, as it is observed in the young, and sometimes in the middle-aged, and apparently healthy, as the result of excessive physical exertion, and mentioned typical examples of this kind.

MUNICIPAL DENTISTRY IN AUSTRIA.

The Austrian medical papers have often urged that some method of dealing with children's teeth is urgently needed, and that it would be a great advantage if such inspection and treatment could be made available for the working classes generally. They accentuate, that the amount of ill health and digestive trouble attributable to unsound teeth is incalculable, and returns from every source show the evil to be increasing to an extent that can almost be termed alarming. The difficulties that stand in the way are each of interest in the question, and the all important question of expense; certain it is that the latter will never be solved till the former changes considerly. The papers call the attention of those who are disposed to make the matter a practical one, to the German system. Some of the larger towns in this country have both the power and will to appoint municipal dentists, and these officers are already at work for about thirty years.

In Frankfort last year 2,666 children were subjected to dental inspection, with the result that no fewer than 2,912 teeth were found too much decayed to be saved, and were therefore extracted, while 699 were stopped. The plan that is followed is for each teacher himself to take his class to the dentist, who examines the children, one after another, noting on a card the state of the teeth as he finds them. When defects are found the patients are ordered to come up on a Saturday and the extractions and fillings are then performed. Not only is the importance of sound teeth being recognized in Germany, but Roumania—a relatively backward country of the great civilized powers in questions of public health—is also taking the matter up, and nine municipal dental institutes for the supervision of teeth have been set up. These facts, surely, may serve to strengthen the hands of those who would like to see similar advantages conferred to the Austrian school children.

THE RELATION OF ALCOHOLISM TO CRIME.

At a recent meeting of the Society of Medical Practitioners, Dr. Glückstal, medical expert attached to the law courts, reported that of 188 individuals charged with homicide, examined by himself, there were twelve malingerers and eight persons who were wrongly supposed to be the subject of mental defects. Of the remaining 168 criminals only twenty-eight were females. The following conditions of health were noted: one case of pregnancy, with mental derangement; one delusions of persecution; two of morphinomania; three of hysteria; ten cases of delusions of persecution; eleven of various states of mental disorders; fourteen of hysteria or epilepsy; eighteen of various diseases, either supposed or known to have an effect on the brain; sixteen of mental defect; and the rest of alcoholism. Dr. Glückstal emphasized the fact that alcoholics formed more than a third of the total number of persons charged with homicide. He added that an examination of the antecedents of criminals grouped under other headings would show that many of the epileptics and mental defective subjects were the children of alcoholic parents. He also pointed out that acts of extreme violence might be committed, not only by habitual inebriates but also by persons in a state of occasional alcoholic intoxication, in illustration of which he quoted cases.

THE TREATMENT OF NERVOUS BREAKDOWN.

The number of nervous breakdowns consequent upon changed political and economic conditions has been largely increased, and recently the neurological section of the Medical Society of Berlin held a meeting to discuss the treatment of neurasthenia. During the discussion Dr. Fenwald advised the use of psychoanalysis, and the selection of amusements, according to the results of examination. Cards and other indoor games, open air sport, plays, and conversation on subjects which arouse the patient's interest, frequently have a beneficial effect. Dr. Fenwald has found visits to friends or complete change of environment valuable. When treating patients in their own homes, he has often found it unwise to relieve women of light household duties, or restrict men from moderate exercise. Exercise and occupation (in the sense of pastime) have a disciplinary effect on patients, the curative value of which is not at present sufficiently recognized, but which he believes to be of inestimable value. Careful selection of cases is necessary. If women were taught dressmaking and millinery, dairy work, basket weaving, the lighter forms of wood carving, drawing, painting and clay modelling, and if men were taught pipe fitting, pattern making, mechanical drawing, carpentry, modelling, gardening, stenography, typewriting, painting (signs and frescoes); and if both men and women were to have a choice of work—then Dr. Fenwald believes our institutions for the treatment of mental diseases would speedily be transformed.

Book Reviews

CIRCULATION

Modern Aspects of the Circulation in Health and Disease. By Carl J. Wiggers, M.D. Lea & Febiger, 1923.

The appearance of a second edition of Wiggers's monograph will be welcomed by all internists. There is a serious lack in American literature of books conceived and written as is this treatise on the circulation. A well balanced and selected discussion of the physiology of the circulation, both normal and pathological, forms the basic subject matter of the book. The clinical sections are naturally derived from the foregoing physiological presentations. The monograph is divided into three sections. The first section is devoted to the circulation in health; the second section deals with the various instruments and procedures which are available for studying the circulation in man. In the third section the data obtained by experimental investigation of abnormal conditions in the laboratory are corollated with the results derived from the application of instrumental methods at the bedside, and these in turin are related with the simpler clinical signs and symptoms. Several new chapters have been added. Throughout the book Dr. Wiggers has incorporated the results of his own well known investigations on the circulation. The bibliography is well selected and gives evidence of the author's scholarly knowledge of his subject. Special emphasis is placed on the dynamics of the circulation, and electrocardiography is allotted its proper sphere as an important, but by no means the most important method of clinical examination of the heart. In his discussion of the blood pressure in auricular fibrillation the author recommends the use of James and Hart's average systolic pressure although Cohn and Lundsgaard more recently have shown the inaccuracy of this procedure. The book can be studied with profit by every physician wishing to obtain a through understanding of the modern aspects of the circulation in health and disease.

GREEK MEDICINE

Greek Biology and Medicine. By Henry Osborn Taylor. Our Debt to Greece and Rome. Editors, George Depue Hadzsits, Ph.D., University of Pennsylvania; David Moore Robinson, Ph.D., LL.D., The Johns Hopkins University. Marshall Jones Company, Boston, Massachusetts. Pp. xv, 151.

Misery may desire to join company but how much more does the worker happy in his field delight to find the companionship of likeminded men of an age long past. Not the companionship alone but the stimulus of men superior in the genial freedom of mind untrammeled by political or religious bondage and free to exercise their eager intellectual curiosity upon all that Nature presented to them—such were the men of whose work Osborn writes and of whom he has given an appreciative estimate. Their character is visible in their work as is that of their times and their environment. There permitted fearless investigation with flexible formation and discarding of theory which advanced biology and medicine to a point to which the world has been slow to return. For Osborn is able to reveal also, when he reaches the time of Galen, how evidences are arising of tendencies which were to enclose scientific progress through long, dark ages. There is no lack of appreciation of Galen's service nor of the breadth and skill of the man. But there is recognition, too, of the faults that lay in his greatness and of the change of spirit drawing from the outside over the field of investigation. It is a book written for the layman but one through which the trained physician will be glad to replenish his knowledge of the debt owed to the Greek scientists.

FUNCTIONAL CAPACITY

Funktionelles Frauennaturen. Mit 164 Abbildungen nach Naturaufnahmen. F. Bruckmann, A.-G., München, 1923, pp. vii, 324.

This book is a valuable handbook of practical directions by which one may cultivate the functional capacity of the human body. The many illustrations give a very concrete form to the discussion of the means for such cultivation and the reasons why it should take place. But even more do the underlying principles which the author has set forth bring home to the reader the functional possibilities and the control of these which lies within reach of each possessor of a human body. Gymnastic exercise and dancing go only part of the way which Mensendieck points out so much more fully. Indeed they proceed along a misleading way, the former because of the limitation of the movements which leaves them out of touch with the demands of everyday life and also because they are movements directed from without and not the result of thought upon one's own body. Dancing, on its part, is also limited to the unpractical and likely to lead to extremes which have nothing to do with true utilization of the capacities of the body. The same may be said to a degree of sports. The body deserves thoughtful observation directed upon it. This is the keynote of Mensendieck's system. To this end she pleads for untrammeled naked observation of it in its training. Thus its action can be watched and the functional capacities of its various parts be definitely studied. Thus also will its true value be enhanced in the thought of the child as of any one else. This will bring not alone direct results in muscular control but it will build up an ideal to counteract the abuse of the body in frivolities or in the forming of it for the wholesale destruction which the years have just witnessed.

CLINICAL METHODS

Einführung in die physiologisch-klinische Methodik für Studierende der Medizin. Von Dr. Paul Liebesny, Wien. Mit 79 Abbildungen im Text und einer farbigen Tafel. Berlin, Wien: Urban & Schwarzenberg, 1923.

The various physiological methods of physical examination used in the practice of medicine are described. The pathology of disease is entirely omitted, but special emphasis is laid on the theoretical, physiological, and especially, the physical fundamental principles of the methods employed. This little book is intended to serve the medical student or practitioner the purpose of brushing up on the subject before entering upon clinical instruction. It includes the examination of the blood and its circulation, the heart and lungs, digestion, urinalysis, electricity and the electrical apparatus used in medicine, various physiological demonstrations on the frog and the tests used in examination of the nervous system, the auditory apparatus and the eye. It contains much that is not found in the ordinary textbook on clinical medicine.

Medicoliterary Notes.

The *Popular Science Monthly* for September is a number of unusual interest. Among articles well worth reading are a few that will be of particular interest to readers of the JOURNAL. These are: The Story of Insulin—A Miracle of Science, by Donald Harris, who outlines the use of the drug in medicine and describes how it was discovered by an unknown young laboratory assistant, Dr. Frederick G. Banting; Proofs of Evolution, by Dr. E. E. Free; and The Power of Autosuggestion, by Dr. James J. Walsh.

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Goitre is becoming very prevalent in Austria, according to a medical report from that country. It has been proposed to combat its increase and help in its cure by introducing the Swiss method of administering iodine salt. According to this method, very small quantities of iodine are added in the cooking salt. This was carried out for six months in a certain Swiss village, with the result that the whole population was almost entirely freed from goitre. A variation of the treatment is for the teachers in some of the schools to give iodine tablets daily to the children, or water containing iodine is furnished in schoolrooms, or in some cases the children wear little wooden boxes containing iodine, like charms round their necks. Similar methods have been tried on animals. A certain species of trout is known to have goitre and, by putting small quantities of iodine into the water where they live, the fish have been cured of it.

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Three articles of special interest in *Mental Hygiene* for July are Delinquency and the Exsoldier, by Dr. W. F. Lorenz, director of the Wisconsin Psychiatric Institute; More Community Aspects of Feeblemindedness, by Gordon Hamilton, of the Charity Organization Society; and Community Responsibility in Mental Hygiene, by Dr. Frankwood E. Williams, medical director of the National Committee for Mental Hygiene.

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In his recently published book, *Cures: The Story of the Cures That Fail,* Dr. James J. Walsh lays stress on two facts: 1, That anything will cure a man when he has nothing the matter with him; and 2, that the longer a doctor practises, the shorter grows his list of drugs. One of the most interesting of the fake cures described was the theriac, sometimes called the calendar, because it contained as many ingredients as the month has days. This cure was in vogue for several centuries and was believed in as late as the middle of the nineteenth. Drug stores kept on hand all the time a jugful, which was made up of spoiled prescriptions thrown into the jug, left overs from drugs, powders, etc., and anything else useless that happened to be lying around. Its curative properties were as many and varied as its ingredients, for it was taken from anything one might have, from toothache to black plague, and hundreds of persons were ready to swear to permanent cures from its use.

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The Proceedings of the Ninth Annual Meeting of the International Association of Industrial Accident Boards and Commissions, held in Baltimore in October, 1922, has been issued for distribution by the United States Bureau of Labor Statistics as *Bulletin 333.*

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Dr. Irving Wilson Voorhees, assistant surgeon to the Manhattan Eye, Ear, and Throat Hospital and advisory physician to the Metropolitan and Chicago Opera Companies, is the author of a book published by Macmillan on *Hygiene of the Voice.* It treats of the art of singing from the point of view of the physician rather than that of the singer.

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Another of Macmillan's fall publications will be *The Way Things Happen,* a play by Clemence Dane, which will be produced in New York during the coming winter. Clemence Dane is the author of *The Bill of Divorcement* and *Will Shakespeare.*

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Dr. J. L. Blumenthal, acting director of the New York City Bureau of Child Hygiene, has written a series of interesting articles for the *Monthly Bulletin* of the Department of Health, describing in full the recent work of the Bureau.

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The New York Society for the Relief of the Ruptured and Crippled has recently completed a survey of the city. It was found that New York has in all about thirty-six thousand crippled persons. About fifty per cent. of these are less than sixteen years old, and about sixty-three per cent. became crippled before reaching that age. Nearly one half of the cases discovered by the field canvass are not being treated; about 3,700 cases have been diagnosed but have stopped attending clinics; over fifty per cent. of the cripples are not known to any agency. It was found that there are available enough operative beds and sufficient clinical facilities, but that the number of convalescent and custodial beds is too small. Very few crippled children are attending school.

* * *

During the nineteen months of the World War, the battle casualties of the United States were 48,000. During these nineteen months the accidental fatalities in the United States were 126,000, of which 35,000 were industrial, 91,999 in homes and streets, of which latter 25,000 were children of school age, injured on the highways. The moral is that we should make our streets, homes, and places of work more safe.—*Weekly Bulletin, New York City Department of Health.*

* * *

A translation of *Impulsive Acts,* by William Stekel, is announced as one of the fall publications by Boni & Liveright. *The New Psychology and the Parent,* by Dr. H. Crichton-Miller, published by Seltzer, is now on the market.

Practical Therapeutics

THE USE OF COCAINE IN THE URETHRA*

By James A. Gardner, M. D.,
Buffalo, N. Y.

I have been stimulated to review this subject of local anesthetics because of the repeated questions of patients who ask: "Why are you able to treat me with so much less discomfort than Dr. Blank?" I have always kept in mind that very trite saying of Dr. Robert Taylor that, "if you can pass an instrument with less pain than your neighbor, you get the patient." Nobody wishes to be a hero—many patients procrastinate and postpone their visit to the doctor because of the dread of the treatment.

In these days major operations are performed under local anesthesia to the great satisfaction of the patient as well as with the avoiding of the risk of the general anesthetic. Why then should local anesthesia be spared if the patients can be made more comfortable and if by relaxing them, your work is made easier.

A number of drugs used for local anesthesia are more or less effective when injected subcutaneously. These drugs have also been used for surface anesthesia of mucous membrane, but as shown by Sollman cocaine hydrochlorid is by far the most efficient. Neimann (1) isolated the alkaloid from the cocoa leaves as far back as 1860, but it was Carl Koller, an ophthalmologist, who demonstrated it in local anesthetics in 1884. Since that time cocaine has come into general use as a local anesthetic on mucous membranes as well as used by injection subcutaneously. As with all powerful drugs at first there were more or less accidents and a few fatalities. Mayer (2) injected morphine before or after cocaine in three frogs. The control frogs injected with cocaine alone survived while all of the morphine-cocaine animals died. He accepts this as evidence that morphine enhances the toxic action of cocaine. The custom of injecting morphine before using cocaine is deleterious.

Calcium chlorid on the other hand seems to inhibit the action of cocaine. A small dose of cocaine stimulates the frog's heart while a large dose arrests its action, but calcium chlorid starts it beating again. When calcium was given first, there was no toxic action. Further experience shows that while calcium salts arrests the action of cocaine, potassium salts exaggerate it.

Fabray (3) relates a case in which he injected ten per cent. solution of calcium chlorid dispelling the toxic condition arising in a nurse of nineteen following the injection of seven mg. of morphine and the application of a spray of ten per cent. cocaine-epinephrin mixture to the laryngeal mucosa and the painting of the tonsils and the palatine area with the same mixture in connection with tonsillectomy. The calcium chlorid was given slowly intravenously. After two c. c. had been injected, a marked change for the better set in. The convulsions ceased, the rapid superficial breathing became slow and deep, and the rigid extremities relaxed. At the same time the pulse grew stronger. A total of seven c. c. was injected of the calcium chlorid in seven minutes. Convulsions returned several times but the intervals became longer and the convulsions milder, yielding readily to the administration of camphor.

It was Carl Mayer, of Basel, who first recommended calcium chlorid in cocaine poisoning. Mayer emphasized the need of great caution in order that none of the solution may be injected perivascularly, since severe infiltrations that heal very slowly may arise.

TOXIC SYMPTOMS.

The symptoms from mild and transient toxic action of cocaine are generally overlooked or are ascribed to the patient's nervousness, but absorption of the drug may include vomiting, palpitation, dizziness, and sweating or collapse or even death (4). All drugs of this type kill by simultaneous paralysis of the heart and respiratory centre. The employment of artificial respiration with intravenous injection of epinephrin is indicated so that the body has a chance to eliminate the drug. It is, however, to be remembered that serious intoxication has been seen in men following extremely small doses of local anesthetics suggesting the occasional existence of a marked degree of hypersusceptibility and in such cases, doses which are relatively small as compared with the average dose commonly employed, may actually be several times the minimum, which would be fatal in a particular person, so that even the most effective resuscitation may fail under these circumstances.

RELATIVE EFFICIENCY.

For anesthesia of the mucous membrane the relative efficiency may be readily seen. Alkalinization increases the efficiency from two to four times. The solution of the anesthetic salts may therefore be mixed with an equal solution of 0.5 per cent. sodium bicarbonate without loss of efficiency and with a saving of one half of the anesthetic. The mixture does not keep well and should be freshly made. The addition of epinephrin does not increase efficiency and is probably useless. The addition of the alkali serves no good purpose for infiltration, but markedly increases efficiency for use on a mucous membrane, with the exception of quinine urea which is less. If you have accidents or fatalities, they should be reported, so that there may be a better understanding of the cause of such accidents and also that they may be prevented. There is a section on therapeutic research of the council on pharmacy and chemistry of the A. M. A. who have undertaken a study of the accidents following local anesthetics.

In our office during the past ten years a cocaine solution has been used in the urethra preceding over fifty thousand examinations and treatments. There have been no fatalities or serious toxic symptoms. In 1898 I began using a four per cent. and eight per cent. solution of cocaine before passing instruments. Not having many patients the solution was often weeks old when finally used up. As I read reports of fatalities in the literaure I was only too glad to turn to any substitute which would give satisfaction and at the same time be safe.

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*Read before the Section in Genitourinary Surgery, New York Academy of Medicine. April 18, 1923.

Some years later Dr. Bransford Lewis suggested alapin. After giving it a trial it was discarded, because it did not give satisfactory anesthesia. Experience proved that freshly made, hot solutions of cocaine were more effective than the same strength in old solution. As the price of the drug increased experimentation showed that a weaker solution would give the required anesthesia. Then with the suggestion of Sollman, that alkalization of the solutions increased its efficiency from two to four times I procured one grain sodium bicarbonate tablets which were dissolved with one and one eighth grain cocaine tablets. These tablets dissolved in thirty minims of water make a four per cent. solution, in two drams of water a one per cent solution, and in a half ounce of water a half of one per cent. solution. An aseptic half ounce syringe has been found to be convenient for administering the solution in the anterior and posterior urethra. One has much better control than when the plunger type is used.

Previous to massage of the prostate a half per cent. solution is all that is necessary to anesthetize the anterior and posterior urethra so that the bladder may be filled. I believe that a half per cent. solution, as I have suggested, will give satisfaction in a great majority of cases. For cystoscopic and endoscopic manipulations as well as the dilatation of tight strictures I find a one per cent. solution gives better results. The solution should be injected slowly and the urethra distended for at least a minute to insure a satisfactory anesthesia. This question may seem only of minor importance, but those who have been patients will fully appreciate it.

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504 Electric Building.

A SIMPLE TECHNIC FOR COLLECTING BLOOD FROM VEIN.

By Albert M. Crance, M.D.
Geneva, N. Y.

There are several methods of withdrawing blood from a vein for the Wassermann, or other tests, however the simplest and easiest method is the one usually looked for. If the blood is taken with the syringe method, there are many objections. It necessitates cleansing the syringe immediately, else the blood will clot within it. The syringe should be dry to begin with, or else it may harm the test to be carried out. Constant expense of breakage is also an objection.

The direct method seems the most simple, and the one of choice. It is only a matter of carrying it out

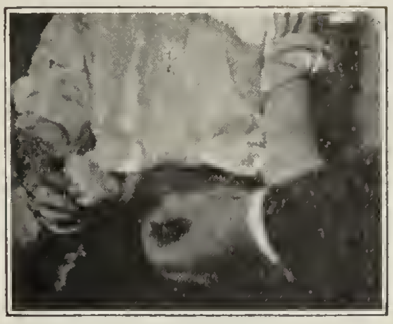

Fig. 1.

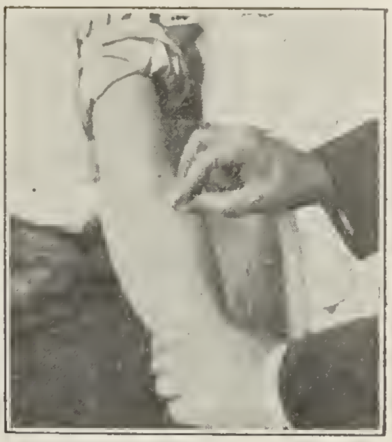

Fig. 2.

Fig. 1.—Step 1.—The patient is placed in a sitting position, either on the table or high stool. He is given a piece of cotton to hold in the right hand. The left sleeve is rolled up.

Fig. 2.—Step 2.—The arm is cleansed as in the usual manner.

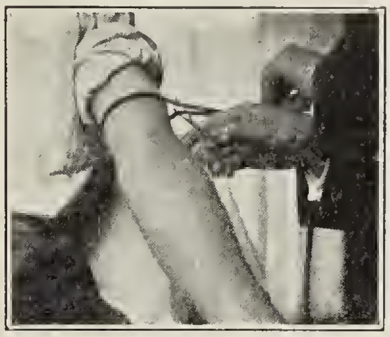

Fig. 3.

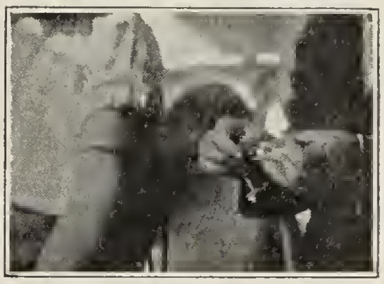

Fig 4.

Fig. 3.—Step 3.—A rubber tubing is drawn once around the arm and tension made with the operator's left hand, while a forceps clamps. In this manner the patient's skin will not be pinched in the tubing.

Fig. 4.—Step 4.—The needle is taken from the sterile wrapper, the needle holder slipped on and adjusted with the setscrew.

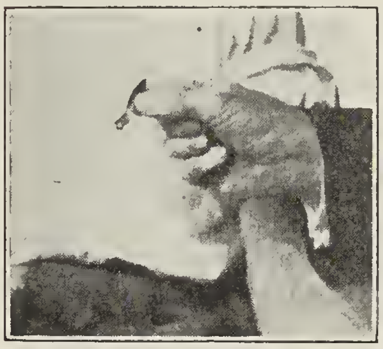

Fig. 5.

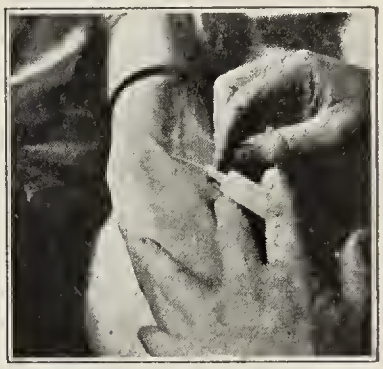

Fig. 6.

Fig. 5.—Illustrating the Swift needle holder and needle ready for use.

Fig. 6.—Step 5.—The tube is held between the index and second fingers of the left hand, the bottom of the tube resting against the thumb. The vein is held firmly in position with the second finger. The needle is held in the right hand, the proximal end is in the tube.

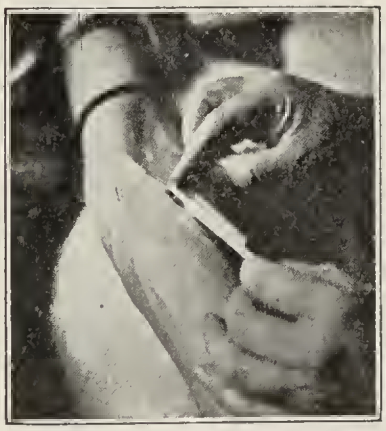

Fig. 7.

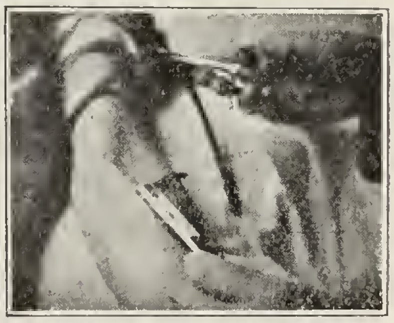

Fig. 8.

Fig. 7.—Step 6.—The needle is inserted into the vein. Illustration shows stream of blood flowing into the tube.

Fig. 8.—Step 7.—When enough blood has been collected, release the forceps, and throw the tubing and forceps aside. The blood will cease flowing.

systematically. The use of a needle holder, such as is shown in the illustrations, makes the procedure much easier, and more satisfactory. The principal things in the method described are the position of the patient, with his arm at his side; placing a piece of cotton in his right hand; the manner in which the tube is held; manner in which it is withdrawn. The method described is simple, quick and very convenient for routine work. With practice, there is no reason why any blood should be spilled on the patient or on the operator.

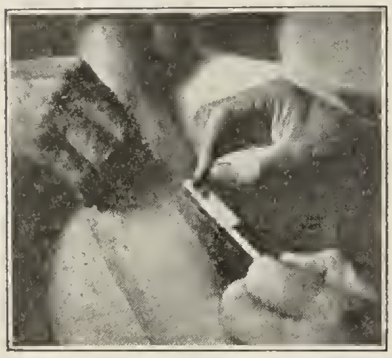

Fig. 9.

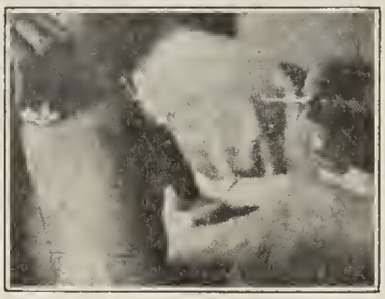

Fig. 10.

Fig 9.—Step 8.—The patient now places the piece of cotton held in his right hand on the area where the needle was inserted, and makes pressure.

Fig. 10.—Step 9.—The needle is withdrawn quickly, leaving the patient pressing with the piece of cotton. He is asked to continue this procedure for about a minute, usually while the operator is corking the tube of blood, and removing the needle from the holder. The photographs illustrate that the procedure should be carried out without losing a bit of blood.

A Modification in the Routine Treatment of Syphilis.—M. Sydney Thomson (*British Journal of Dermatology and Syphilis,* January, 1923) states that the organic compounds of arsenic, even though they do not possess the specificity at one time claimed for them, are nevertheless of undoubted value. The almost miraculously rapid disappearance of signs and symptoms in an early case, consequential on their use, must not be allowed to overshadow the essential importance of continuous mercurial administration. Nor must it be forgotten that the salvarsan group itself is not without danger to the patient. He asserts that the method of administration here described reduces the danger to a minimum without in any way impairing the efficiency of the treatment. The rate of excretion of arsenic must be considered and its accumulation avoided if it is desired to eliminate all possibility of disaster.

Instead of frequent small doses of novarsenobillon, a minimum of three injections of 0.9 gm. is given, the interval between each being at least three weeks. The majority of early cases give a negative Wassermann reaction twenty-one days after the final dose. The blood is tested quantitatively at each injection to observe the effect of the treatment. The minimum of injections is given, even though the negative reaction of the blood appears previous to the completion of the course. The intravenous therapy is continued until a negative reaction is attained. The longer the period between infection and treatment, the greater the difficulty in obtaining a clear test. Few of the early cases require more arsenic than is administered during the first two months of treatment. Mercury is given as soon as a definite diagnosis is made and is continued throughout the whole period of treatment in the form of a tablet consisting of a hydrargyrum cum creta, one grain, three times daily, except for the discontinuance of the treatment because of stomatitis, etc. Once the Wassermann reaction has become negative the patient is given the mercury continuously for at least one year. During this year frequent tests are performed and the patient is kept under careful observation. All treatment is stopped when the reaction has been clearly negative for at least twelve months. The test is then applied every six weeks for a further year. Should this prove continuously negative during the whole period of probation, a lumbar puncture is made and the cerebrospinal fluid is examined. This is subjected to all the tests for syphilis and on its proving satisfactory the patient is discharged as cured. Of course, on suspicious clinical signs must have supervened during these two years of observation.

Flat or Weak Feet in Children.—S. Kleinberg (*Archives of Pediatrics,* January, 1923) mentions the following most frequent and important causes of flat or weak feet in children: 1, static; 2, muscle weakness and anemia; 3, rickets; 4, trauma; 5, infectious diseases; 6, prolonged or exhausting illness; 7, obesity; 8, improper footwear and 9, congenital. There are two types of flat feet—the flaccid and the spastic. The symptoms do not depend upon the severity of the flat feet. Besides pain in the feet, legs, or knees, children may complain of tiring easily, indisposition and irritability. The shoes may be conspicuous evidence of the distortion of the feet during walking, being worn down on the inner side of the heel and sole and showing marked bulging of the shoe over astragalus and inner malleolus. There are two elements in the deformity, valgus abduction of the foot and depression of the longitudinal arch.

Small children with flat feet, even though they are painless, should be treated for the deformity. In a child of two or three years of age, elevating the shoes about quarter of an inch on the inner side of the soles and heels is usually sufficient. The shoe must have a broad toe and low heel. Strapping of the feet and legs to support the varus is helpful. If the raised shoe does not suffice, a model should be made of the feet and a pair of corrective plates should be provided. In a child of three to six years of age, the routine should consist of shoes raised quarter of an inch on the inner side of the sole and heel and corrective foot plates. In a child past six years of age, the treatment should consist of properly constructed shoes raised on the inner side, corrective foot braces and instruction in the proper method of standing and walking; also exercises which involve the use of the plantar, flexor, and adductor muscles of the feet. Properly constructed flat foot braces should be made over corrected models of the individual foot so as to fit properly, should hold the foot in the normal position in relation to the leg and should exert no undue pressure on any part of the foot. These requirements are met perfectly by the Whitman brace. The proper shoe is one that supports the foot and does not constrict any part of the foot or disturb its balance. The shoe should have a moderately low and broad heel, the shank should be narrow and the sole broad and the inner side of the toe from tip to heel should be practically a straight line; the toe should be full and rounded.

Proceedings of Societies

WESTERN SURGICAL ASSOCIATION

Thirty-second Annual Meeting, Held at Minneapolis, Minn., December 8 and 9, 1922.

The President, Dr. Miles F. Porter, of Indianapolis, Ind., in the Chair.

(Concluded from page 252)

Postoperative Ventral Hernia.—Dr. James M. Masson, of Rochester, Minn., stated that the treatment of this condition fell into two subdivisions: preventive and curative. Preoperative medical management of obese patients was essential. They should be put to bed on a restricted diet with increased elimination to reduce weight and to lower blood pressure. Postoperative hernias, not preceded by infection, occurred most often in the low middle line incision. Great care should, therefore, be exercised in closing such incisions, and it was advisable to open the sheath of the rectus on each side and make a closure exactly the same as in the ordinary straight incision. Local nerve blocking, supplemented, if necessary, by nitrous oxide or ether, was the anesthesia of choice.

In cases of small hernia, no preliminary treatment was required, but massive hernias should be reduced as much as possible before operation. The manner of closing wounds would vary with the tissues concerned. Anatomical closure was the procedure of choice, if approximation could be effected without undue tension. In all other cases a plastic overlapping, on the same principle as the Mayo operation for umbilical hernia, was advisable. It was important to remove all possible fat from the surfaces that were to be brought into apposition, and to obliterate any space in which serum or blood might accumulate. Care should be taken not to overlap too much, or undue tension would result. No tags of omentum should escape between the stitches, hemorrhage must be controlled as thoroughly as possible, and fascia should be overlapped wherever possible. All buried suture material should be of catgut, or some absorbable suture material. Twenty-day chromic catgut No. 1 or No. 2 was the suture material of choice.

Preservation of the Facial Nerve During the Complete Removal of the Parotid Gland for Malignant Tumor.—Dr. Alfred W. Adson and Dr. W. O. Ott, of Rochester, Minn., said that in the operation for removing the parotid gland, the inframandibular branch of the seventh nerve was first exposed through an incision which extended from a point three cm. above and posterior to the lower tip of the mastoid and to a point four cm. anterior to the angle of the jaw. The inframandibular branch of the seventh nerve was then traced backward until the temporal and cervical divisions of the seventh nerve were exposed. Then an additional incision was made down from the zygoma and just in front of the ear above the parotid and this incision was connected with the one previously described. The section of the glands should be carried downward in the line of the incision from the zygoma and should be deep enough to expose the mandible and the temporal border of the posterior masseter muscle. The dissection must be kept close to the cartilage of the ear and back of the parotid gland, care being taken not to injure the temporal branch of the facial nerve. By this method the two surgical fields could be connected. After this the temporal and cervical divisions of the facial nerve penetrated only the lower lobe of the parotid for a distance of approximately two cm. after which it lay under the parotid. If this dissection was complete, the skin with the parotid might be elevated, leaving the peripheral branches of the facial muscles undisturbed. The incision was then carried forward sufficiently to elevate all of the parotid, dividing and ligating Stenson's duct. The next step was to lift the seventh nerve and dissect out the deep lobe of the parotid gland behind the mandible and mesial to the seventh nerve. The wound was closed with a subareolar stitch of catgut and with a dermal stitch of horsehair.

Tumor of the Face; Meningocele.—Dr. Herman E. Pearse, of Kansas City, Mo., stated that the patient was a Mexican child, two years of age, who had had a tumor of the face from birth. The patient was given ether anesthesia by catheter into the mouth. Incision was made from the bridge of the nose downward and to the left along the inner edge of the tumor, curving outward beyond the upper lip into the cheek. The tumor was dissected out with some difficulty. It proved to be a cyst filled with clear fluid. The hard base was the cartilage of the nose with a quarter inch of fibroid tissue overlying its upper part. Its dissection laid bare the bones of the upper jaw, the inner angle of the orbit, and the nasal cavity. Within the nose it could not be separated from the bones of the face. The cyst ruptured in attempting to release its wall from the nasal margin. A canal an eighth of an inch in diameter was passed upward to the middle line, where the frontal bones united. It appeared to attach itself to the undersurface of the frontal bone in front of the cribriform plate. No meningeal fluid escaped. At the close of the operation the diagnosis of keratoma seemed most probable, because no discharge of meningeal fluid occurred, but two days later the wound began discharging meningeal fluid, making a diagnosis of meningocele imperative.

Surgical Aspects of Disorders of Digestion.—Dr. Willard D. Haines, of Cincinnati, Ohio, stated that trauma in the absence of infection played little, if any, part in the production of ulcer as demonstrated by the clinician. The fact that ulcers attacked that part of the duodenum extending from the pyloric ring to the point of entrance of the common duct and the pyloric fifth of the stomach, had led to much speculation, concerning the causes for such predilection. The mucosa lining this section of the duodenum was not as well protected from the influence of the acid chyme as it left the stomach as were the duct bearing and terminal segments of the gut, nor was the first part of this viscus as freely supplied with blood as were the second and third divisions.

In dealing with the ulcer, he preferred excision to infolding by suture in conjunction with gastrojejunostomy. One of his earlier papers contained a description of a method of perforating the remaining coats of the stomach wall in operating for gastric ulcer. The method was based upon observation made by the ophthalmologists, that an ulcer of the cornea which perforated always healed. The opening thus made in the crater of the gastric ulcer was closed by tier suture. The procedure served to put the tissue immediately surrounding the ulcer at rest and some benefit seemingly accrued, in that postoperative recovery was in some instances more prompt than when gastrojejunostomy alone was performed. Recently destruction by cautery had been substituted for this method with very satisfactory results.

Cystin Calculi, a Complex Surgical Problem.—Dr. C. E. TENNANT, of Denver, Colo., said that cystin calculi were comparatively rare. Until 1882 only fifty cases of cystinuria had been reported in the literature. Kretschmer, in his comprehensive study of the subject of cystinuria and cystin stones, found reports of but one hundred and seven cases of the stones, including two cases of his own, which occurred in twin boys, nine years of age. Cystinuria tended to run in families, there having been found in twenty-two cases collected by Poland, a group of ten occurring in four families. The disease had also been found in three successive generations.

Cystinuria might be divided into three groups: 1. The low grade form in which the patient could digest cystin administered by mouth, but could not break up that originating within the organism, while neither the oxidation of administered aminoacids nor the oxidation of aminosalts originating within the system was affected. His case was an example of this group. In the second group the patient eliminated cystin formed within the organism. In the third group the severest grade was represented in patients who eliminated administered cystin, as such, although this had not been tested out in any actual case.

The Value of the Röntgen Examination in the Early Diagnosis of Postoperative Ileus.—Dr. JAMES T. CASE, of Battle Creek, Mich., said that the technic which he employed in the röntgen examination was very simple, it being necessary simply to wheel a portable röntgen apparatus to the patient's bedside, slide under him a 14/17 inch film with intensifying screen in the proper film holder and to make an exposure of from two to five seconds. No dressings were removed. No opaque medium needed to be administered. The whole procedure required not more than five minutes. The film was at once developed and it might be studied immediately after being dipped in the fixing solution. The developed film would reveal at once whether there was any gas distention within the abdomen, and if so, whether the distention occurred within the stomach or within the large or small intestine. The small and large bowel might be distinguished by the characteristic outline of the gas areas. The appearance of the gas distended coils of jejunum or ileum were characteristic, lying more or less parallel, the calibre of the gut being increased one and one-half, two and even three inches as measured on the film. A certain amount of postoperative distention of the small intestine was frequently noted where there were no symptoms suggestive of obstruction, but in the serious cases, the degree of distention was at once apparent and suggestive. If doubt still existed as to the fact of the obstruction, a small amount of barium sulphate, say half an ounce, might be administered by mouth in a little water and another film made five or six hours later. Enough barium would reach the small intestine in this time to identify more definitely the small intestines.

Peritoneal Drainage.—Dr. CUTHBERT POWELL, of Denver, Colo., stated that drainage, socalled, of the peritoneal cavity did not remove infection nor did it allow the escape of but a negligible amount of fluid present in the general peritoneal cavity. On the other hand, the presence and pressure of drains undoubtedly militated against the recovery of the patient. Except in definitely localized and walled off abscesses, and possibly in those now fortunately rare late cases of general suppurative peritonitis, when the whole cavity was filled with pus under pressure, drainage was contraindicated. The surgeon's duty had been performed when the focus of infection had been removed and the abdomen closed in as short a time as was consistent with a proper technic, and with a minimum of trauma and exposure of the peritoneum.

Sliding Hernias of the Cecum and Appendix in Children.—Dr. VERNON C. DAVID, of Chicago, stated that while hernias containing cecum and appendix in their sacs were not uncommon, real sliding hernias were rarely seen in children. Coley in 2,200 cases of hernia found the cecum alone in the sac in eighteen, the appendix alone in ten, and the cecum and appendix together in seven. Judd found fourteen sliding hernias in 1,652 cases, and of these six were of the cecum and on the right side. Baumgartner collected 159 cases of sliding hernia from the literature, eighty-five of which were rightsided. Four were left inguinal hernias containing the cecum. The two most discussed factors in the causation of sliding hernia in children were the rotation of the cecum and the descent of the testes during fetal life.

NEW YORK ACADEMY OF MEDICINE

SECTION IN GENITOURINARY SURGERY

Meeting held on November 16, 1922

DR. ABRAHAM HYMAN in the Chair.

The Results Obtained by Various Methods in Tumors of the Bladder.—Dr. HUGH H. YOUNG, of Baltimore, read this paper by invitation. He presented a most interesting series of results, for the most part in statistical form, of his experiences in treating bladder tumors, and made an appeal for the more active use of radium. The paper is published in full in the September 5th issue.

Discussion.—Dr. E. L. KEYES opened the discussion. He stated, in the experimental, developmental stage of treating malignant growths, thanks to fulguration and radium, we were arising from the absolutely hopeless period described by Dr. Young, but had not yet reached any standard method of treatment. Dr. Keyes said it was his own impression, and doubtless that of many others, that we should continue to cure as many cases by fulguration as possible, but that such cases would be for the most part those of papillomata; for carcinomata, x ray or radium, with or without resection, should be used. The really dangerous tumors, the large infiltrating carcinomata, were apparently more curable by resection than the papillary carcinomata. The one place where malignant tumor should not be was at the bladderneck.

Dr. **Edwin Beer** stated that his particular experience was totally at variance with that of Dr. Young and Dr. Keyes, who reported better results in infiltrating carcinoma of the bladder than in papillary carcinoma. He himself had found that infiltrating carcinomata presented the greatest problem in this whole field. It seemed to him that it would be worth while to standardize the treatment of bladder tumors so as not to vary, and he outlined a method of standardization. He believed that, in infiltrating carcinomata, the use of radium would be more relied upon, and the combination of partial removal with implantation of radium, would give better results than a simple operation.

Dr. **B. S. Barringer** favored radium rather than operation in the removal of bladder carcinomas, for, 1, radium destroys cancer cells more easily than normal cells; 2, it produces an obliterating endarteritis which destroys the nutrition of the carcinoma and so destroys the growth itself. Also, he said, there was a large class of tumors and carcinomata which could be destroyed by the intravesical use of radium, either applied on the surface, or by implanting radium seeds in the base of the tumor. In this way, many infiltrated carcinomata could be destroyed without operation. Again, when there was a large tumor that had to be exposed by suprapubic section in order to put the radium in, the operation was a shorter one than the excision of the tumor by operation alone, and there was less disturbance of the kidney. In his opinion, most of the cases who died did so because of failure of the kidney function.

Dr. **Leo Buerger** said it was his custom not to regard any tumor as absolutely benign, but as potentially malignant, for his experience had shown him that in apparently benign papillary growths tumor cells may be found already in the lymphatics at some distance, and these cells may show abnormalities although the pedicle of the tumor, histologically, is nonmalignant. The successful results obtained from the fulguration method, however, had shown that the percentage of manifest malignancy was not so great as many believe. His treatment of primary carcinomata consisted of snaring the tumor, then fulgurating the base. He was not so enthusiastic about the use of radium as the others, especially as regarded surface applications. His method was to introduce radium into the bladder with the aid of the cystoscope, with which it was possible to leave the metal needles in place attached to a thin wire. A form of carcinoma where radium offered great advantage over operation was that type situated near the ureteral orifice or starting in the lower end of the ureter at the lips of the ureter's vesical orifice. These could be made to disappear by the use of the Buerger cystoscope. In recurrence radium was very valuable; in all cases of inoperable carcinoma it should be employed.

Letters to the Editor.

CONCERNING THE ETIOLOGY OF GASTRODUODENAL ULCERS

New York, *August 13, 1923.*

To the Editor:

I have noticed Dr. F. B. Turck's letter in the New York Medical Journal and Medical Record, August 1, 1923, concerning my article on the etiology of gastroduodenal ulcers which had appeared in the June 6, 1923, issue of the same journal. If I misinterpreted Dr. Turck's ideas it may be my fault, or it may be because Dr. Turck has not made them clear enough, but I distinctly remember having read a few years ago in the *Medical Record* an article by Dr. Turck, wherein he stated that he had produced peptic ulcers in dogs by feeding them with Bacillus coli, and he also stated there that the gastric acidity enhanced the development of these microbes. Unfortunately, I cannot now lay my hand on that article.

That I am not alone in thus being mistaken can be seen from an article by A. C. Ivy, Ph.D., in the *Journal A. M. A.*, vol. 75, p. 1539, December 4, 1920, wherein the author states: "Turck reported the occurrence of perforating ulcers of the duodenum and stomach on feeding cultures of Bacillus coli." Nothing else is mentioned besides the Bacillus coli.

I am glad, however, that Turck does not agree with the bacterial theory of this affection. Still, I regret to say, his animal experiments do not explain the peculiarities of these ulcers, such as their rarity in children, their occurrence in hyperchlorhydria or normal chlorhydria and seldom, if ever, in achlorhydria, etc.

I agree entirely with Dr. Turck concerning the great value and importance of animal experimentation. But while serving as a corrective of our notions of human medicine, it must also elucidate, complement, and explain the phenomena of human physiology and pathology, and not be at variance with well established pathological and clinical data in man, otherwise the results of animal experimentation are of greater interest to the veterinarian than to the physician.

I will quote again from the excellent monograph of Welch on ulcer of the stomach (*Pepper's System of Medicine*, Vol. 2, p. 514): "Gastric ulcers have been produced experimentally in animals in a variety of ways, but these experiments have not materially elucidated the pathogenesis of ulcer in man." And I shall add that the latest experiments on animals have not done so either. Now, my theory, which is based on the laboratory study of the urine and stomach contents of patients, explains all the phenomena concerning the disease in question. I have even tried a new treatment with apparently beneficial results, namely, the exhibition of urotropin, which I have found beneficial in phosphaturia in general. But I considered it premature to dwell on treatment, and I did not mention it in my previous article.

Now let others, with more means and facilities at their disposal, do the rest in clinical observation and animal experimentation, if my theory interests them. I am satisfied that I have, so to say, made out a good case in favor of my theory.

E. Palier, M. D.

Abstracts from Current Literature

PEDIATRICS.

Infant Feeding: Facts and Fallacies.—James Burnet (*Archives of Pediatrics,* February, 1923) shows that many fallacies are allowed to creep in the feeding of cow's milk and its preparation. The milk should generally be diluted to reduce the protein. Plain water is the best diluent. Sugar is by no means necessary for every infant and it may cause digestive trouble; there is absolutely no need for milk sugar, which may cause indigestion in some cases. The use of cream is rarely necessary and the author prefers to use a good milk in which there is a proper amount of fat. The author believes in simplicity in infant feeding, with which he has obtained good results.

Rickets.—Eric Pritchard (*Archives of Pediatrics,* February, 1923) believes that all conditions of malnutrition in infants and young children, arising from any cause whatsoever, whether of bad feeding or malhygiene, provided they are severe enough and long enough continued, must inevitably lead to rickets, because all such conditions conduce to the development of an acidosis, and consequently to mineral depletion and calcium impoverishment, which is the fundamental cause of the rickety condition. He shows that all known and recognized etiological factors in rickets are also familiar etiological factors in acidosis; that all the clinical symptoms of rickets, that is, the mineral depletion of the tissues, the excessive calcium output in the emunctories, the muscular debility, the nervous irritability, etc., result from an acidosis which creates a demand for calcium which is far more urgent and vital than the less essential claims of growing bones or other tissues; furthermore, the prophylactic and curative treatments of rickets and acidosis are the same. Finally, it seems fairly obvious that if such utterly different etiological factors as vitamine starvation, carbohydrate excess and improper hygienic conditions can all lead to rickets, there must be some common ground on which they all meet, which can be no other than that particular phase of metabolic failure which results in the incomplete oxidation of the food which serves as the source of bodily energy and which leads to the production of an excess of acid bodies. For this reason and by a process of exclusion he believes that all the various etiological factors of rickets are merely remote or contributory factors.

The Fat Soluble A Vitamine and Rachitis.—C. E. Bloch's experiments (*Monatsschrift für Kinderheilkunde,* A. Czerny Festschrift, March 25, 1923) indicate that clinical rachitis is not due to a deficiency of fat soluble A vitamine in the organism or in the food. Clinical experience shows that rachitis cannot be a deficiency disease, as it develops not only independently of the amount of the fat soluble A vitamine in the food, but even when all the other necessary substances are present in the food in sufficient amounts. Two clinical observations, however, indicate that rachitis is due to a deficiency of the fat soluble A vitamine: the curative action of codliver oil, which contains much fat soluble A vitamine and that rachitis heals spontaneously during the summer months. Rachitis is not cured by the fat soluble A vitamine in the form that it occurs in milk and codliver oil must contain other substances than the fat soluble A vitamine that are effective. The result in the treatment of rachitis with ultraviolet rays indicates that the sunlight also has a therapeutic value. Nevertheless, the fat soluble A vitamine is a very important element in the diet.

Feeding with Butter-Flour Mixture.—Richard Hamburger (*Monatsschrift für Kinderheilkunde,* A. Czerny Festschrift, March 25, 1923) asserts that the reserve fat formed as a result of feeding fat has certain advantages over the fat resulting from the feeding of carbohydrates in certain infants. He favors the addition of one hundred grams of a soup containing five grams of butter and five grams of flour. The same dangers as regards tuberculosis lurk in raw butter as in raw milk. This mixture is useful in mixed feeding cases. The contraindications for its use are acute disturbances and atrophy. If the feces show a neutral and alkaline reaction, or even a weakly acid reaction, the fat is well tolerated and the stools will show calcium soap. If the feces are strongly acid in reaction, this mixture may result in increased dyspepsia, as a result of the formation of fatty acids. Slight constipation may also result. The addition of sugar improves the condition; if it does not help, or if diarrhea develops after the use of the butter-flour mixture, the use of fat should be discontinued.

Enuresis in Children.—N. T. Saxl and Peritz M. Kurzweil (*Archives of Pediatrics,* March, 1923) advance the following rules and regulations in all cases of enuresis, which must be carefully observed by the parents and the patient:

1. No coffee, tea, cocoa, or spirituous liquors of any kind. 2. No fluids of any nature four hours before the hour of retiring, with the supper, consisting of solid food at a stated time. 3. A cold friction rub to the chest, sides and lumbar spine is sometimes advised in older children. 4. Elevate the foot of the bed one or two inches from the floor. 5. The patient should sleep on the right side and not on the back and a towel should be tied around the patient with the knot at the back. 6. Hands are to be kept outside the coverings. 7. Prescribed medicine should be taken regularly and exactly as directed. 8. Patient or parent must present a written chart of progress at each subsequent visit.

Cases with focal causes, such as oxyuris vermicularis, masturbation, cystitis, vulvovaginitis, anemia, malnutrition, neurasthenia and neuroses and neurogenic diseases require appropriate treatment. In cases of anemia and malnutrition, strychnine is a valuable adjuvant. Endocrine disturbances are given thyroid and posterior pituitary extract. Cases of highly acid urine, diabetes and nephritis are treated symptomatically. Idiopathic cases (undetermined origin) respond satisfactorily to atropine sulphate in large doses. The majority of cases of enuresis are amenable to treatment when diligence and perseverance are patiently observed by the physician.

Treatment of Summer Diarrhea in Infants and Children.—Donald Paterson (*Clinical Journal,* July 18, 1923) thinks that the loss of water by perspiration and otherwise during the summer months, and the failure of the attendants to furnish water for the baby to drink and so replace this loss, is a large factor in the mortality from summer diarrhea. He says: If this child were, say, two or three years of age there would be no difficulty in diagnosing the case earlier, as a bilious attack, and treating it accordingly. So should the infant be treated in the early stages. In the later stages, however, the problem of dehydration is to be dealt with, and this is the most important problem in summer diarrhea. The dehydration may be secured by the following methods:

1. *Intravenous injection of saline.*—This method is to be advocated only in very urgent cases. The saline is injected into the longitudinal sinus through the anterior fontanelle; this, however, requires great skill and asepsis and is accompanied by a certain amount of shock, and only a small amount of fluid may be injected at a time.

2. *Subcutaneous method.*—By this method a much larger quantity of fluid may be injected, the shock is less, there is less risk of sepsis, and the whole operation can be done by a person much less skilled. This is the method to be preferred if you cannot do the operation yourself and entrust it to a nurse.

3. *Intraperitoneal method.*—An extensive trial was given this method at Great Ormond Street in the summer of 1921, and on the whole the results were good in urgent cases. There is, however, a risk of infection, both by introducing organisms or from wounding the bowel itself, and it should be undertaken only when the subcutaneous method is not practicable. The advantages are that this method is quick, a large amount of saline being introduced at a known temperature. With the subcutaneous method, the introduction is slow and the saline has time to cool.

4. *Saline by the mouth.*—This is the method of choice for every child still able to swallow. The child is put to no inconvenience or risk. There is no pain involved. Very large quantities of fluid may be introduced this way. The saline is absorbed rapidly from a very large surface and the quantity absorbed automatically adjusts itself—no more being absorbed than the child requires. If the infant is offered sufficient quantities of saline by the mouth the dehydration is made good by this method much more rapidly than by any other method at present in use.

The saline should be half normal strength. It should be one half teaspoonful of salt to the pint. The bottle should be kept filled and beside the child, and he should be offered it as often as he is awake. At regular periods food should be offered the child also. The author states that he has known one infant of ten months to drink seventeen ounces of saline in two hours and gain one pound in the first day. As soon as the intestine has been washed and dehydration accomplished the child will fall asleep. Next he will commence refusing the saline and prefer his food. The number of stools will decrease.

The author believes that in most cases of summer diarrhea the children die, not of the upset or poisoning by infection, but by their mechanical result—dehydration.

Alkalescence of Cerebrospinal Fluid in Infancy.—A. Rálint (*Monatsschrift für Kinderheilkunde,* A. Czerny Festschrift, March 25, 1923) finds a constant carbonate content in the cerebrospinal fluid in infancy under normal conditions. In cerebral, especially inflammatory diseases the fluid shows a local acidosis, whereas other infectious processes do not show constant findings. Comparative investigations show that the acidosis of the cerebrospinal fluid does not run parallel with acidosis of the blood. In this respect, spasmophilia may be included among the cerebral processes. In other cases the presence of a generalized acidosis may be inferred from the presence of the acidosis of the cerebrospinal fluid. The method of investigation is so simple and the results are so accurate that it may be recommended for clinical purposes.

Intoxication Syndrome in Infectious Conditions in Infancy.—G. Bessau, S. Rosenbaum, and B. Leichtentritt (*Monatsschrift für Kinderheilkunde,* A. Czerny Festschrift, March 25, 1923) conclude that: 1. Infectious conditions which are associated with the intoxication syndrome (infectious intoxications) are not limited to any definite months of life nor to any definite time of the year. 2. The disturbances of temperature in the infectious intoxications are usually determined by the infectious noxa. 3. Exaggerated respiration is a symptom that, with few exceptions, is pathognomonic for the intoxication syndrome and at the most may be considered as being due to bacterial infection. 4. In infectious conditions the intoxication syndrome is just as little strictly associated with the administration of food as in the alimentary disturbances. 5. Their true cause is the same as in the cases due to alimentary causes: the exsiccation, the signs of which are never missing. 6. The causes of the exsiccation are the diarrheas and an increased excretion of water by the lung and from vomiting. 7. The elements of the intoxication syndrome in the picture of infectious intoxications should be combatted by correcting the loss of water. 8. Lactosuria occurs in both alimentary and infectious intoxication.

Nonspecific Serum Treatment in Infancy.—Berthold Epstein (*Monatsschrift für Kinderheilkunde,* A. Czerny Festschrift, March 25, 1923) states that proteotherapy in the form of nonspecific serotherapy also has a certain significance in infancy. In isolated forms of marasmus, which develop on the soil of a constitutional congenital inferiority, definite results were obtained in the primary atrophies and in the atrophies which appear in poorly flourishing premature children, in pseudopremature births, or in malformed children. But the conditions were different in the asthenic states, which are caused by exogenic, as for example infectious, injuries. In these cases an effect upon the body weight should be sought and this is often only transient. The cause of the disease itself, however, is not affected, the advance of the infection is not hindered, and the unfavorable outcome of the disease is occasionally delayed, but never prevented. This excludes the possibility that such an effect upon the body weight, which is not indifferent for the general condition, may be the decisive factor. More cannot be expected of proteotherapy in infancy. If these limitations are borne in mind this form of therapy is applicable in infancy.

Bacterial Asthma in Children. The Role of Infection and the Value of Vaccine Treatment.—Samuel Hurwitz (*Medical Clinics of North America,* September, 1922) finds: 1. That the attack of asthma usually begins after some respiratory tract infection; 2, that every subsequent attack is usually introduced by a new cold or bronchitis, generally at a season when nasobronchial infections are prevalent; 3, that many asthmatics are subject to more or less bronchitis during intervals between the attacks. The bronchitis should be considered as the inciting cause of the recurring attacks. Good results are often obtained, either with the eradication of a focus of infection surgically or with bacterial autogenous vaccines, or both in combination. In chronic bronchial infections, autogenous vaccines derived from the sputum are useful. Streptococci, both hemolytic and nonhemolytic, seem to predominate in the deep respiratory passages of these patients and pneumococci and the micrococcus catarrhalis are less common.

The treatment with autogenous vaccines is usually begun with small doses of pure vaccine at seven day intervals, each succeeding dose being regulated according to the reaction to the previous dose. The dosage ranged from fifty to one hundred million organisms to five hundred million to one billion bacteria. With this treatment, some patients were relieved for a little over a year and many had relapses. The cases that showed no improvement may be explained as follows: 1, Either the wrong bacteria were isolated; 2, or the bacteria isolated were only a part of the cause; 3, or the offending bacteria may not readily produce immune reactions; 4, or irreparable damage may have resulted in the bronchi and lungs from long continued bacterial invasion.

Tuberculosis in Childhood, Its Specific Diagnosis and Treatment.—Julius Grósz (*Monatsschrift für Kinderheilkunde,* A. Czerny Festschrift, March 25, 1923) arrives at the following conclusions regarding his experiences with the treatment with Koch's old tuberculin: 1. Koch's old tuberculin proved to be an excellent remedy in the treatment of tuberculosis in childhood, showing cures or, at least, considerable improvement. 2. The treatment is begun with very minute doses of old tuberculin (0.001 milligram and upward), which is slowly and carefully increased. The cases were treated for many months, sometimes for one to two years, up to the time of complete cure. 3. During the treatment only very slight rises of temperature of a few tenths up to half a degree centigrade are allowable; greater febrile reactions had best be avoided. 4. Only patients with a relatively good condition are suitable for tuberculin treatment, who are afebrile or subfebrile. Phthisical patients, in whom there is a marked destruction of tissue, are not suitable for this treatment. 5. Definite results were obtained in the occult cases, in whom the röntgenographic examination revealed only slight tuberculous changes. 6. Good results were obtained in the first and second stages of pulmonary tuberculosis, also in patients with so-called scrofulous changes in whom the Pirquet reaction was positive, then in the cases of tuberculous peritonitis and in the tuberculous skin affections. 7. The treatment with tuberculin aids the hygienic and dietetic measures.

Progressive and Malignant Endocarditis in Childhood.—F. John Poynton (*Lancet,* February 3, 1923) asserts that malignant endocarditis in childhood shows the same features as in the adult, though, as a rule, it is more rapid in its course. The symptoms are fever, sweating, anemia, purpura, Osler's spots, infarctions, optic neuritis and retinal hemorrhage, drowsiness, aneurysms, diarrhea, cerebral hemorrhage or embolism, hematuria, enlargement of the spleen, cardiac bruits and a continual excited action of the heart. This likeness to the adult cases is most significant when the close association with acute rheumatism is seen. The author holds that there is a rheumatic malignant endocarditis which may arise from the simple form or be primary in origin. He also believes that the mysterious cases of streptococcal origin in adults are either primary cardiac rheumatism of a malignant type, or, if not actually rheumatic, more closely allied to the rheumatic infection than any other. In other words, they are due to a strain of that group, just as there are different strains in other great infections.

Congenital Cyanosis and Congenital Heart Disease, Without Murmurs.—Mark S. Reuben and Walter C. A. Steffen (*Archives of Pediatrics,* December, 1922) find that in any case of congenital cyanosis presenting other symptoms which suggest the presence of congenital heart lesions (enlargement of heart as shown by x rays, dilatation of the capillaries of the eye, clubbing of fingers, erythrocytosis, high hemoglobin content, osteoarthropathies, increased alveolar carbon dioxid tension, accentuation of the second pulmonic sound, etc.) without any murmurs, in most cases, is associated with pulmonary stenosis or atresia and a defect in the interventricular septum and patent foramen ovale; very often these lesions are associated with saddle aorta and persistent ductus arteriosus. In the great majority of cases the lesions are multiple. Sixty to seventy per cent. of these cases do not complete the first year. Congenital heart murmurs not infrequently disappear; they may leave no semblance of previous cardiac deformity or they may leave behind all the symptoms. It is a striking fact that the signs and symptoms very often do not correspond.

Regulation of the Respiration Frequency in the Newborn and During the Early Years of Life.—T. Hishikawa (*Schweizerische medizinische Wochenschrift,* March 29, 1923) shows that in the newborn the respiratory frequency is arranged to a limited zone of frequency, which frequency varies in different individuals. During the course of the first few days this range of variation is diminished by those with a greater frequency approaching the others. The average rate of respiration sinks from the day of birth to the third day of life from 78 to 61 and the variation lies between 106 and 70 on the seventh day, to remain at about this level during the first year of life. During the course of the second and third years the average and the variable values sink to about half the values of the first year of life. The duration of the respirations which follow one another shows sudden changes during the entire first year of life, which diminishes rapidly in the succeeding years. These phenomena should be considered as a gradual adaptation and adjustment of the regulatory mechanism of the frequency of breathing.

RESPIRATORY DISORDERS.

Arena's Method of Homogenization of Sputum for the Purpose of Demonstrating Tubercle Bacilli.—Alexander Roseblüth (*Wiener klinische Wochenschrift,* February 8, 1923) recommends Arena's method, which is carried out as follows: five or ten c.c. of sputum, respectively, are mixed with forty-five and ninety c.c., respectively, of a ten per cent. ammonium chloride solution for five to ten minutes until homogenization results; if this is not sufficient, ten to twenty c.c. of glycerin are added. This mixture is put into an incubator for thirty or sixty minutes, respectively, at 37° C. and then centrifugalized at a speed of 2000 to 2500 revolutions. The fluid is then carefully poured off and the sediment is smeared on a glass slide, where it is fixed by heat. The smear is then stained by the Ziehl-Neelsen method and it is then decolorized by at least 2.5 per cent. nitric acid.

Influence of Glands With Internal Secretions on the Respiratory Exchange.—David Marine and Emil J. Baumann (*Journal of Metabolic Research,* July, 1922) produced a prolonged absolute rise in heat production in eighty-two per cent. of thirty-three rabbits in which both suprarenal glands were completely removed, and in forty per cent. of rabbits where the suprarenal function was crippled by freezing. The rise in heat production may last from a few days to several months, the longest period studied being twenty-three weeks. This increase in heat production appears to depend partly upon the increased rate of discharge of the iodine containing hormone from the thyroid. Suprarenal injury does not impair the ability of the thyroid to store iodine or to produce this hormone. Infection, trauma, nerve injury, muscular movement and diet are not essential factors in the increased thermogenesis following suprarenal injury.

What Should Be Done With the Healthy Epiglottis After Total Extirpation of the Larynx?—Karl Kofler (*Wiener klinische Wochenschrift,* January 4, 1923) describes a case in which the epiglottis that was left behind after a total extirpation of the larynx made swallowing very difficult and had to be removed subsequently. Therefore, inasmuch as the epiglottis is a superfluous organ after this operation, the author advises its extirpation, except in those special cases, where it is advantageous to retain it.

Fatal Congestive Hemorrhages Into the Lungs and Central Nervous System From a Momentary Excessive Bodily Exertion and Its Relationship to Perthes's Pressure Congestion.—E. Hedinger (*Schweizerische medizinische Wochenschrift,* August 24, 1922) describes a case, in which extensive pulmonary hemorrhages and less extensive hemorrhages into the temporal gyrus and into the cervical portion of the spinal cord occurred as a result of an enormous exertion, associated with a marked venous hyperemia of the lungs and of the veins of the skull and the vascular apparatus through rhexis and diapedesis. On the other hand, in compression of the trunk there is no marked cyanosis of the face and no multiple hemorrhages into the skin and the mucous membranes of the head and neck in Perthes's pressure congestion; in the latter, there are also no hemorrhages into the brain and the spinal cord.

Problem of the Tonsil.—Fritz Schlemmer (*Wiener klinische Wochenschrift,* September 21, 1922) shows that the palatine tonsil, just like the rest of the lymphatic substance of the oropharyngeal cavity, does not possess sufficient afferent lymph vessels: the efferent flow from the tonsils proceeds exclusively centripetally to the anterior superior jugular glands and there is no centrifugal current to the pharynx. The lymphatic tracts of the tonsils, just like all such tracts of the skin or mucous membranes, begin blindly and an open communication toward the pharynx does not exist. The author, therefore, rejects the generally accepted conception of the tonsillar apparatus as a lymph gland tissue, but considers it as a part of the total mucosa. He therefore considers himself justified in his position against the theory of anginosis.

Diagnosis of Septic Sinus Thrombosis.—William Milligan (*British Medical Journal,* September 9, 1922) asserts that typhoid fever is the disease with which septic sinus thrombosis is most likely to be confused, especially during the first week of typhoid fever and if the ear happens to be suppurating; the presence of a positive Widal reaction, petechiæ and the absence of very marked fluctuations in the temperature, with rigors or chills, aid in the making of the diagnosis. The septic sinus thrombosis is differentiated from a central bronchopneumonia by the persistent cough, the rusty sputum and the more even temperature. The examination of the blood and the presence of the Plasmodium malariæ serve to differentiate the septic sinus thrombosis from malaria. In rare cases of severe gastric attacks in infants and young children, especially in the presence of running ears, the septic sinus thrombosis is likely to be overlooked. Typical cases are usually recognized without difficulty, but atypical and latent cases may present extremely complex problems. The author does not hesitate to perform an exploratory operation to expose or actually slit up the sinus merely for the purpose of making the diagnosis.

Prophylaxis of Diphtheria.—F. v. Werdt (*Schweizerische medizinische Wochenschrift,* November 2, 1922) discusses the contagiousness of diphtheria, particularly the part played by the carriers of the bacilli, based partly on his own observations in schools, whereby he found 12.5 to 31 per cent. of carriers, according to the stage of the epidemic. Inasmuch as the determinations of virulence in regard to the decision of the question as to which of the carriers are capable of transmitting the infection, are too expensive and time consuming, all of the carriers must be treated just as if they carried virulent strains of bacilli. The author then discusses the difficulty of distinguishing between the true diphtheria bacilli and the diphtherialike bacilli. In the examination of a great number of specimens the morphological characteristics must be the decisive factor. None of the remedies proposed act as sure disinfectants in every case, but many are effective in some cases. Sprays and instillations into the nose seem to act more effectively than touching or painting of the tonsils. The other important factor in epidemics is the cutaneous inoculation according to the method of Schick in order to show all those that are susceptible to diphtheria and their immunization according to the method of V. Behring.

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Studies on Bacterial Nutrition.—Theodor Thjotta and O. T. Avery (*Journal of Experimental Medicine,* November, 1921) report that the growth accessory substances which occur in blood have been found to exist also in plant tissue. Raw potato can replace blood in the cultivation of Bacillus influenzæ.

Pfeiffer's Bacillus and Influenza.—Bacteriological examinations of lungs at necropsy by S. W. Patterson and F. E. Williams (*Lancet,* October 14, 1922) over a period of twelve months, during which time three distinct prevalences of influenzal attack were noted, yielded information which supports the view that the incidence fluctuations of the Bacillus influenzæ as a lung parasite are independent of the particular pulmonary condition associated with it.

Bronchial Asthma and Fever.—P. F. Holst (*Norsk Magazin for Laegevidenskaben,* August, 1922) in his study of the relation of rise in temperature to be the periodical disappearance of asthmatic attacks offers the following explanation: In the same way that anaphylactic shock may produce a state of antianaphylaxis in guineapigs, so that injections with the same albumen that in the first instance produced the shock may be made later without any recurrence of the shock, fever may produce antianaphylaxis in asthmatic patients, that will last for some time. The fever may have formed active antibodies. If the question is considered from another angle, i. e., the increased vague innervation present in most asthmatic attacks, then not only adrenalin, but any agent that stimulates the sympathicotonia will have antiasthmatic action. It is possible that fever might produce such a sympathicotonia—or the fever producing agent. The symptom complex of fever has also been interpreted as a result of sympathicotonia. The favorable effect of iodine in these cases which has always been considered due to the effect on the bronchitis, may also be due to its stimulating effect on the adrenals. Also the favorable effect of iodine on asthmatic patients might be traced to increased thy- excluded.

Changes in Mothers' Milk During Lactation.—W. Birk (*Monatsschrift für Kinderheilkunde,* A. Czerny Festschrift, March 25, 1923) shows that human milk and cow's milk behave alike in regard to their content of nutritive substances and salts during the course of lactation. Heretofore this has been a moot question. He also shows that human milk does not lose any of its richness in salts and albumen even after a lactation lasting three years.

Secondary Infections Complicating Pulmonary Tuberculosis.—R. C. Wingfield (*Lancet,* January 13, 1923) does not advocate the administration of autogenous vaccines in every case of pulmonary tuberculosis where the character and bacteriology of the sputum lead one to suspect a secondary infection, but rather tries to show that there are certain types of cases in which, even under sanatorium treatment, secondary infection of clinical importance can be recognized and will respond to vaccine treatment.

Changes in the Leucocyte Picture Following Injections of Gelatin in Tuberculous Children.—Paul Heim (*Monatsschrift für Kinderheilkunde,* A. Czerny Festschrift, March 25, 1923) shows that there is, as a rule, an increase in the number of lymphocytes following the injection of gelatin in the benign cases, whereas the cases showing a bad prognosis are characterized by the fact that there is absolutely no effect upon the lymphocytes and they may even be diminished in number. With a reasonable amount of care this reaction may be of prognostic value and it may also be used as a therapeutic aid in miliary tuberculosis.

Rapidity of Sedimentation of the Erythrocytes in Pulmonary Tuberculosis.—Hans Poindecker and Karl Siess (*Wiener klinische Wochenschrift,* December 14 and 21, 1922) come to the following conclusions in regard to the practical value of this test and in regard to in what condition it is applicable: 1. The rapidity of the sedimentation of erythrocytes in citrated blood varies within certain limits even in healthy individuals. 2. On the exclusion of other causes favoring the sedimentation, an increase in the rapidity of the sedimentation favors the assumption of a disease process in the lung associated with a tissue necrosis of exudation; this test gives no information regarding the specificity of the pulmonary disease and not always sufficient information regarding the nature of the pulmonary involvement. 3. It should be used only with great care in the diagnosis of preeminently fibrous forms of tuberculosis; higher sedimentation values allow the drawing of conclusions regarding its activity. 4. The beginning phthisis can be differentiated from the benign apical tuberculosis by the sedimentation test. 5. It is a delicate indicator of the activity and regarding the progression of a phthisical pulmonary involvement and has a definite value in the prognosis of these conditions. 6. The determination of the sedimentation rapidity affords important information in the recognition of occult focal reactions and in the guiding principles for the carrying out of a specific treatment. 7. This test is easily carried out in practice and should not be omitted in any examination of the lungs; but it is valuable only when carried out with the most painstaking care and when all other factors favoring the sedimentation of the erythrocytes are roid activity leading to sympathicotonia.

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Summary of Symptoms of Encephalitis Lethargica*

By FRANCIS X. DERCUM, M. D.,
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The initial symptoms of encephalitis lethargica are generally vague and not characteristic. They may, however, be featured by a sense of illness, weakness, headache, general pains, chills, loss of appetite, nausea, symptoms of invasion of the respiratory passages (i. e., increased discharge from or catarrhal inflammation of the nasopharynx, nasal and accessory sinuses, of the auditory passages, of the bronchial tubes and even of the pulmonary tissue); at other times of irritation or invasion of the gastrointestinal tract. In many cases the onset is not featured by any of these symptoms; all socalled prodromata may be absent.

With or without them, we note among the earliest symptoms dimness of vision, diplopia, partial ptosis, faint cranial nerve palsies; perhaps a little apathy, a little confusion, perhaps insomnia; then headache, somnolence and, rarely, convulsions.

Fever also is present though this fever is rarely high and is quite irregular in its course. Quite commonly it ranges from 99° to 101° or 102°. Very rarely is it high; in only one of my cases did it reach 104°. Not only is its course quite irregular, but its duration, too, is uncertain; frequently only a few days, sometimes a week or two and rarely longer. Respiration and pulse show but little change, though sometimes a slight rise in frequency of both are noted.

Among the most striking symptoms in the average case is the somnolence, but of equal prominence and indeed at times so early as to precede the somnolence are the eye symptoms. These consist more especially, as already indicated, of diplopia, ptosis, dimness of vision. The diplopia is frequently so pronounced that the patient may of his own accord complain of it or the divergence of the globes is so marked that the persons about the patient may call attention to it. Quite commonly the symptom is transitory, i. e., lasts but a few hours or a few days and then disappears, but very frequently the patient retains a very clear memory of its occurrence. The strabismus may be convergent or divergent; the diplopia homonymous or crossed. It is usually the most striking and the most constant of the ocular symptoms; also the very first to attract attention. It should be added that instead of being transitory and fugacious, it may be persistent, though this is relatively infrequent.

The ptosis is also an early symptom. It may precede, follow, but more frequently accompanies the diplopia. It is not a frank palsy but merely a paresis. The eyelid falls, but as a rule the eye is but half closed, the cornea but half covered. It may affect one eye, though more frequently both. It may vary—sometimes markedly—in degree on succeeding days or even during the same day. Finally, it is a symptom which on the whole is much more persistent than the diplopia. In cases in which diplopia is absent or, having been present has disappeared, marked asthenia of the extrinsic muscles of the eye can, as a rule, be readily demonstrated. If the patient be directed to look upon an object to one side so that an effort at decided lateral rotation of the eyeballs is necessary, it will be noted that the muscles become fatigued very quickly; sooner or later the globes return to the median position.

The dimness of vision I regard as a symptom of great importance, as it is not only an early and striking symptom but one which may be present when both the diplopia and the ptosis may be absent or but slightly evident. The dimness of vision, too, is likely to be misinterpreted and may be referred to possible changes in the optic nerve or retina and yet an ophthalmoscopic examination of these structures may reveal them to be normal. A brief examination, however, shows that the dimness of vision is due to a paresis of accommodation and frequently also of convergence. There is an undoubted paresis of the ciliary muscle, hence the feebleness of accommodation and the resulting lack of clearness in vision. The iris seems also in many cases to share in this paresis.

In striking contrast with the paresis to accommodation is the preservation of the light reflex. In by far the larger number of cases the light reflex is clearly and definitely intact, and this gives rise to a

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*Read in a symposium on Encephalitis Lethargica before the Philadelphia County Medical Society, December 13, 1922.

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reversed Argyll-Robertson pupil. On the other hand, to show the vagaries in the ocular symptomatology of encephalitis, I should state that the opposite dissociated palsy, namely loss of the light reflex and preservation of accommodation—a true Argyll-Robertson pupil—has been recorded by both German and Italian observers though it must be conceded that such an occurrence is excessively rare. Finally like all the other eye palsies it may prove to be temporary.

As regards the impairment of vision one important caution must be added. In a limited number of cases, a true amblyopia and even a true amaurosis may be noted. This, however, like the other symptoms, is transitory and is unaccompanied by any changes in the fundus. Very rarely, however, a true swelling of the disc has been noted, or there has been a blurring of the edges of the disc with tortuosity of the retinal veins and pallor of the temporal half of the disc, perhaps a slight hyperemia or a slight neuritis. On the other hand, a retrobulbar neuritis has been noted or even a frank double optic neuritis with small hemorrhages. Such findings, however, appear to be secondary to gross changes within the cranium, such as meningitis, marked involvement of the ears and consequent involvement of the great venous sinuses and are not directly attributable to the encephalitis but to its complications.

In addition to the involvement of the intrinsic and extrinsic muscles of the eye there may be involvements variously of the seventh, eighth, ninth, tenth, eleventh and twelfth cranial nerves. These are indicated by facial palsy or rather by facial paresis often faint in character, by dulness or impairment of hearing, by loss or impairment of the sense of taste, by difficulty of swallowing, by paresis of the soft palate, of the larynx, or of the tongue. Extensive involvement of these structures is infrequent though it now and then occurs.

In regard to the other and later oncoming motor phenomena, the motor sequelæ, such as the Parkinsonian rigidity, catatonic fixations, choreiform, clonic and athetoid movements, tremor and irregular voluntary movements, and the rarer hemiplegias, monoplegias and contractures, and the epileptiform convulsions, time will not permit of an extended consideration.

The motor disturbances are in the main referable to lesions of the striatum. The Parkinsonian and allied symptom groups point directly to lesions of the lenticular nucleus, more particularly to the pallidum and the pallidal tracts. It would appear that the innervation of the muscles of the head, trunk and extremities depends both upon the impulses derived from the motor area of the cerebral cortex and upon those derived from the pallidum, and that the normal muscle tonus is the resultant of the interaction of these two series of impulses, and which appear to exercise a mutual inhibitory action upon each other. In destructive lesions of the pallidum, therefore, the muscles are given over to the impulses derived from the cerebral cortex and the rigidity of the Parkinsonian symptom complex so often observed after encephalitis lethargica is due to the excessive preponderance of the cortical motor innervation; it is a true motor cortex or pyramidal hypertonia. Very significant is it also that in this condition the tendon reflexes are but little modified, possibly moderately increased, while the Babinski sign is invariably absent. The presence of the Babinski sign points to pyramidal involvement but such involvement it would appear is rare. The same explanation applies of course to such symptoms as catatonic fixations and cataleptoid phenomena. The choreiform, clonic, athetoid and allied disturbances of motion are, I believe, to be referred to lesions of the putamen and caudatum, that is, to those portions of the striated body that lie external to the pallidum.

The rare hemiplegic, monoplegic and allied symptom groups like the epileptiform attacks are of course to be referred to pyramidal and cortical involvement. The motor disturbances referable to lesions of the striatum it should be emphasized greatly preponderate in this disease.

Sometimes symptoms are also present clearly pointing to involvement of the membranes, i. e., to the presence of a meningitis. Suffice it to say that the symptoms present in a given case may point to a diffuse involvement of many structures and that special symptoms merely indicate the accentuation of the damage done by the infection to certain portions of the nervous system; it may be to the pallidal system or to the pyramidal system, or it may be to the caudate nucleus or perhaps to the cerebral cortex, or to all of these structures variously combined. It may be added that cerebellar symptoms also may occur though they are admittedly unusual.

Turning our attention now to the somnolence we find that it at times precedes, at times follows, but most frequently accompanies the ophthalmoplegia. This somnolence consists in the majority of cases merely of sleep; sometimes this sleep is very profound but it is not coma nor even stupor nor torpor. The patient is aroused by stimuli of various kinds; e. g., by speaking to him loudly, by shaking him, by pinching or by pricking. Usually he can be made to answer questions. He chews food that is placed in his mouth, swallows, is continent, does not soil his bed or his clothing. At times he can even be made to sit up in bed and it may be to walk.

Instead of somnolence, the patient may suffer from insomnia. If insomnia be present, it is usually associated with excitement and at times with confusion or delirium.

The question now arises are there any sensory phenomena present in encephalitis lethargica. It may be definitely stated that marked sensory losses are not a feature of encephalitis. The patient's somnolence, however, is such that sensory phenomena unless painful are usually not noted. Upon a few occasions various paresthesias have been observed such as formication, sandy feeling, and at others a sense of tightness or tension; rarely has hyperesthesia been noted and then is painful in character. Equally rare have been pains suggesting a central origin; namely due to lesions of the thalamus. Sometimes a pain suggesting a root pain and somewhat more frequently pain suggesting a neuritis is observed. On the whole, however, painful manifestations are found to be the exception.

Every now and then spinal symptoms are especially prominent. The symptoms depend of course upon the special structures of the cord involved and upon the degree of this involvement. Palsies suggesting diffuse or transverse lesions of the cord may, though rarely, be observed. Sometimes the symptoms point to the involvement of special columns as in a case of my own in which the symptoms suggested an ataxic paraplegia and in which the sphincters also were affected.

The peripheral nerves likewise may present symptoms in encephalitis though this complication is quite infrequent. However, a frank neuritis with its attendant pain and other symptoms may occur. Always the other symptoms showing unmistakably the existence of encephalitis lethargica are present; the neuritis merely gives a special picture to the case.

The examination of the spinal fluid deserves a brief mention. First, it is not characteristically changed. It is usually clear. Its pressure is normal, sometimes slightly increased, sometimes decidedly increased, though this is the exception. No increase or a moderate increase of globulin or lymphocytes may be noted. If these elements are decidedly increased, it probably indicates a more marked involvement of the membranes. I have in almost every one of my cases been able to secure an examination of the spinal fluid. This examination has commonly not yielded significant results. Studies of the blood in my cases have also failed of definite information; commonly merely a variable degree of leucocytosis, at times a reduction in the red cells and hemoglobin, but there were no characteristic changes.

Regarding spinal fluid examinations in encephalitis lethargica they should, I am convinced, be made with caution. In my judgment only enough fluid, at most four c. c., should be removed. I think it very probable that if the intradural pressure be suddenly and greatly reduced, the diffusion of the germs of the infection will be greatly favored. Further, I am quite convinced that spinal drainage in encephalitis not only does no good but may be productive of harm.

Unfortunately time will not permit of an adequate consideration of the course of the disease, of its spontaneous recoveries or fatal endings, of its sequal so often persistent and chronic, nor of the distressing recurrences of symptoms, often late, in patients who had previously made an apparent recovery. First, the course of the disease is admittedly irregular. Time and again cessation of progress or apparent recovery are observed only to be followed, often many months later, by a distressing recurrence of symptoms. In my experience complete recovery is rare, and it cannot be said in any given case that the danger of recurrence has passed away until a long time has elapsed. Very few cases are left without some traces of the affection. Not infrequently I have noted in cases with recovery slight but persistent pupillary phenomena, or slight flattening of the features as though the facial muscles had never fully recovered their normal tone; or it may be that the attitude of the patient is faintly suggestive of the Parkinsonian symptom group. So slight a symptom, for instance, as the failure of the arms to swing, while walking, in unison with the contralateral leg may be a sufficient hint of slight, though permanent, damage.

I need hardly state in conclusion that quite a large number of patients die in the early period of the disease. My impression is that in the year 1919, when the present epidemic first made its appearance in this country, that a larger proportion of patients died than in the years following. The cause of death is to be ascribed at times to exhaustion and intoxication; at others directly to the damage done to the nerve centres. Sometimes visceral lesions feature in the death though this is unusual. The cases which survive and which persist with slight or pronounced sequelæ appear to live with varying periods of improvements and accentuation of symptoms for a number of years. It is too early as yet to say much definitely as to the eventual outcomes.

Catalepsy in Epidemic Encephalitis*

A Clinical and Pathological Report of a Case of the Cataleptic Type with an Explanation of This Phenomenon

By JOHN H. MUSSER, JR., M.D.,
and A. E. BENNETT, M.D.,
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In the multiplicity of writings on the symptoms of epidemic encephalitis the term catatonia has been used rather loosely to describe a certain type of disease. One hesitates before adding more to the already voluminous literature of acute epidemic encephalitis, but with the feeling that any report which tends to clarify the existing literature or add new knowledge to this remarkable disease is justifiable, we offer the following report:

Catatonia as a symptom has been reported in many organic cerebral affections viz., general paresis (1), uremia (2) and a tendency to maintain given positions (catalepsy) has been observed in this hospital in senile deterioration and cerebral thrombosis. Hoch (3), Kirby (4) and others have shown that negativistic phenomena and catatonic reactions occur in organic deliria and toxic infectious psychoses as well as in benign emotional stupors. It is not surprising then that among the protean manifestations of encephalitis cataleptoid symptoms are seen.

Early in the English epidemics several writers described interesting cateleptic types: Balton and Still (5), Hall (6), and Wilson (7). Wilson concluded that reduction of mental activity to the level of automatism was common and catatonia was a frequent symptom of the disease. Many authorities in this country have observed cataleptic states and reported

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*From the medical service and neuropathological laboratory of the Philadelphia General Hospital. Read before the College of Physicians, Philadelphia, April 23, 1923.

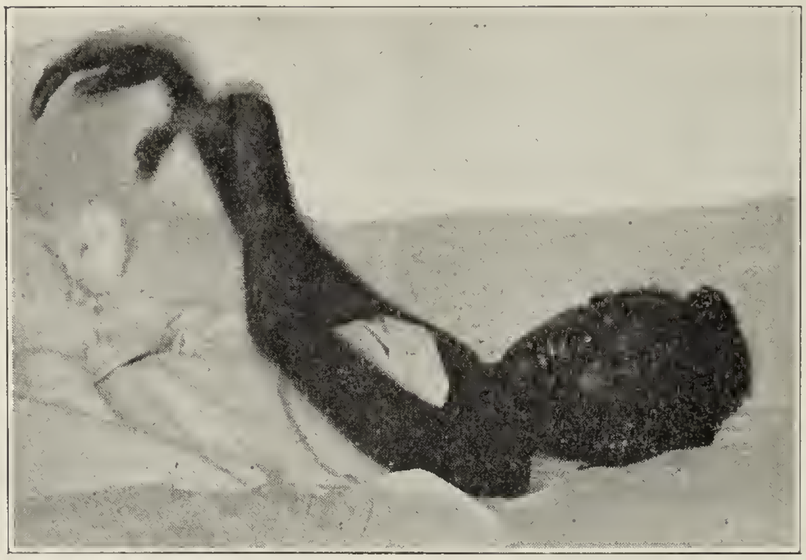

Fig. 1.—Shows the patient in stupor late in the disease with fine tremors of the hands but still maintaining given positions.

cases of this type: Barker (8), Kennedy (9), Hohmann (10), and bond (11). Hohmann states these have been mistaken for schizophrenic reactions. Tilney and Riley (12) report an instructive case with choreic movements at the outset, shortly followed by stupor with hypertonic rigidity and later showing catalepsy. This sequence of symptoms seems usual in this type and was the order observed in our case. They suggest a clinical cataleptic type in their classification and believe the prognosis is less severe in this form than is usually supposed. On the other hand Bassoe (13) says: "In severe cases the whole body becomes rigid and all movements slowed, a condition resembling catatonia and advanced paralysis agitans rigidity occurs. A good imitation of flexibilitas cerea." Jones and Raphael (14) in writing on muscular hypertonicity and stupor in encephalitis associate catalepsy with substupor types. Sicard and Bollack (15) report a case that presented fixed attitudes and recovered but with a paralysis agitans syndrome. Petren and Brahme (16) in a recent article report a case in which there was almost complete immobilization of the body (only ocular, respiratory and swallowing movements being conserved) which persisted for months with no true paralysis. Improvement resulted but Parkinsonian-like rigidity remained as a sequel. They assumed from clinical observation that the symptoms are due to extrapyramidal lesions and that lesions of this system must be capable of causing such an enormous hypertonia that not even passive movements are possible.

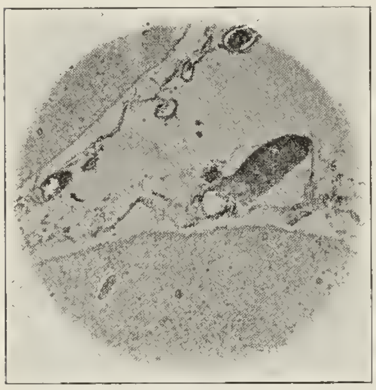

Fig. 2.—Meninges over cortex. Shows slight infiltration with round cell elements.

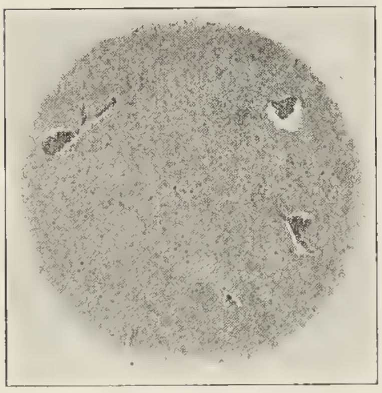

Fig. 3.—Pons. Shows typical findings in epidemic encephalitis.

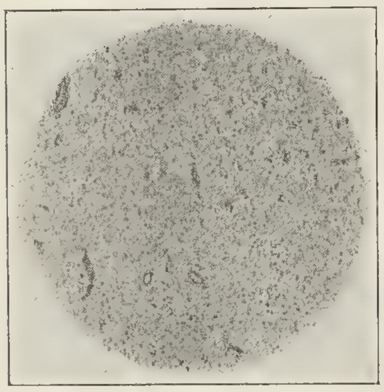

Fig. 4.—Thalamus. Note intense dotting with round cell elements and lessened number of ganglion cells, and vessels with collars of cells.

Kirby and Davis (17) have written very clearly upon the subject. They object to the clinical grouping "lucid catatonic form," reasoning that this is not a distinct type but only different in a superficial way from other forms. They also with justification object to the misleading term catatonia in describing patients of an organic psychotic type who tend to maintain a certain fixity of position. They, as well as Tilney and Riley (12), associate this flexible hypertonus with paralysis agitans symptoms, especially the rigidity. Furthermore, they have observed no symptoms of negativism in their patients nor any of the characteristics of catatonic stupor as seen in dementia precox.

Various interpretations of the mechanism concerned in the production of this amyostatic syndrome — hypermyotonia with rigidity and catalepsy, have been offered. Tilney, Riley, Howe, Kirby and Petren are of the opinion that disease of the extra palliospinal system is entirely responsible for these phenomena. Wechsler (18) is doubtful whether involvement of the extrapyramidal system alone explains it. He states it is more likely a true cerebral condition or interference of cerebral function and consequent liberation of uncontrolled unconscious activity as illustrated in hypnotic catalepsy. He quotes Southard's and Alzheimer's pathological studies in catatonic dementia precox as a basis for this conclusion. The close similarity of our case to other cases in which in all there was marked evidence clinically of striated system inflammation and the pathological findings in our case—extensive degeneration in the basal ganglia especially the thalamus and substantia nigra (19)—leads us to agree with Kirby, Tilney, Petren and others that cataleptic symptoms in the encephalitis are part of the picture of a severe Parkinsonlike syndrome or a mixed striatal type of the

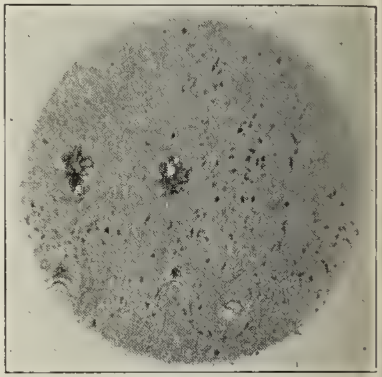

Fig. 5.—Normal substantia nigra.

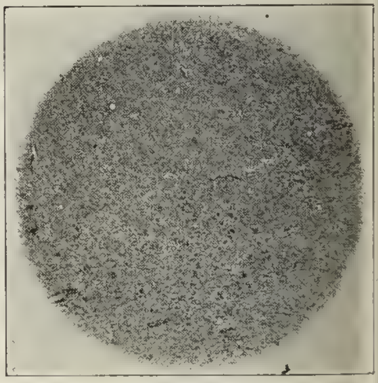

Fig. 6.—Substantia nigra showing almost complete absence of normal cells and intense dotting with round cell elements.

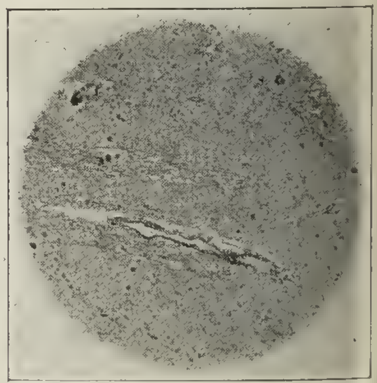

Fig. 7.—Substantia nigra, showing lessened number of normal cells, increase in round cells, and vessels with perivascular infiltration beside a strand of fibres of the third cranial nerve.

disease. Furthermore, there may be varying degrees of this hypermyotonia in the disease dependent upon the location and extent of inflammation present in the striatal system.

CASE.—A. B., colored female, sixteen years of age, was admitted to the Philadelphia General Hospital, March 9, 1923. The following history was obtained from the mother: The patient was a normal, healthy girl prior to her present illness which began in the latter part of February, 1923, with a slight cold. On February 27th, the mother noticed the patient persisted in smacking her lips, this continued for a day, then it was noticed she acted queerly; leaving the house to go outside and back again, next she became dizzy, nauseated and vomited. On the evening of March 1st, on returning from school, she expectorated constantly; the mother also noticed excessive salivation. On March 2nd, peculiar body movements were observed, irregular movements of head, eyes and protrusion of the tongue. At this time the patient appeared overactive and excited (played the victrola constantly, running about the house, and other activities). She was then taken to a physician who told the mother he thought the child had St. Vitus dance. The body movements became more pronounced and the arms and legs became involved. On the morning of March 3rd, on arising she fell asleep while dressing and complained of pain between her shoulders. She gradually became more drowsy and the body twitchings more pronounced, (mother feared she would have convulsions). The salivation persisted and the lethargy became more profound so that she refused food; body movements ceased and she remained mute, in which condition she was admitted to the hospital. The patient never complained of headache nor any oculomotor symptoms.

Examination on admission.—A young normally developed negro girl, lying immobile in bed like an image. She could be aroused to obey simple commands such as showing her tongue or opening her eyes, but executed these with greatly delayed reaction time; she would not answer questions, but nodded her head in answer; there seemed to be some active negativism in attempting to examine the patient. There was general body rigidity, her arms at first resisted passive motion and were held in catalepsy for indefinite periods (this picture was so striking that the receiving ward physician hesitated in assigning the patient to the medical wards until he obtained the above history). Later cogwheel resistance was pronounced in the arms. No myoclonic twitchings or tremors could be seen. Her general physical examination was essentially normal.

Her neurological examination disclosed the following: Eyes; pupils irregular in contour, reacted sluggishly to light, accommodation not tested; a persistent lateral nystagmoid oscillation was present during the entire illness, excessive lachrymation and salivation were noted, all other cranial nerves were negative. Reflexes: The biceps and triceps on both sides were active; abdominals: uppers were present and the lowers absent; the patellars were overactive on both sides, the plantar reflexes were flexion; an abortive ankle clonus was present on the right side and absent on the left; bilateral Kernig's sign was present.

Progress of the case.—On the 10th her lethargy had increased to stupor; she could only be roused by strong stimuli; she continued to show the general body rigidity resembling the waxy flexibility of catatonia. On the 12th she was in coma, her deep reflexes continued overactive, the Kernig was increased, the cogwheel phenomenon and cataleptoid symptoms persisted; at this time fine rhythmic tremors of the outstretched fingers were noted. The plantar reflex had disappeared on the right but irritation on the right brought out a crossed reflex of the left side in the form of a fine rhythmical tremor of the toes. On the 14th (Fig. 1) her tremors were more marked, the catatoniclike symptoms persisted, but her outstretched arms slowly descended to the bed as though from weakness, the pupils failed to react to light and abdominal reflexes were abolished. On the 16th following spinal drainage she came out of her stupor, answered questions and obeyed commands; this lasted only a few hours; she then relapsed into increasing coma and on the 18th there developed signs of a bronchopneumonia, the patient becoming gradually weaker and died on the 21st.

Her temperature on admission was 98° F, but soon rose to 103° (by axilla) and continued between 102° and 107° most of the time; for several days ranged from 105° to 107°. The pulse rate was between 130 and 150, with respirations 20 to 25, going up higher with her penumonia. At first she had urinary retention and later incontinence. Nasal tube feedings were required during the entire time.

Laboratory findings.—Several spinal punctures with drainage were done. The fluid was always clear and never under increased pressure, in fact at times there was difficulty in obtaining enough for the examinations. The first examination showed 9 cells per cm. with no globulin; two other counts showed eleven and 36 cells respectively with increased globulin. Wassermann in blood and spinal fluid was negative, colloidal gold showed a mildly luetic type of curve, smears for tubercle bacilli and other organisms were negative. The pH value of spinal fluid was reported in one at 7.4 and in another specimen (collected under oil) at 21° C. 7.75 and at 38° C. 7.5. Urinary examinations except for a trace of albumin were negative. Spinal fluid chemistry showed a urea of 18 mgm. and sugar of 85 mgm. per 100 c. c. The blood picture showed, hemoglobin 86, leucocytes 6,950, polymorphonuclears 65 per cent., lymphocytes 35 per cent. The carbon dioxide tension of the blood plasma was 49 per 100 c. c. A throat culture showed almost a pure strain of hemolytic streptococcus with a few colonies of Freidlander's bacilli. The blood pressure varied from 110/80 to 90/70. Examination of the eye grounds revealed normal fundi.

A clinical diagnosis of acute epidemic encephalitis and terminal bronchopneumonia was made. A necropsy four hours after death revealed the following gross and microscopical findings of the viscera: Aorta—atheroma; heart—hypertrophy; chronic interstitial myocarditis; lungs—bilateral bronchopneumonia; spleen—acute diffuse and chronic interstitial splenitis and congestion; kidneys—acute parenchymatous degeneration; liver—cloudy swelling and congestion.

The following brain and spinal cord studies were done by Dr. N. W. Winkleman, neuropathologist of the Philadelphia Hospital.

Grossly the brain and cord appeared normal. Routine sections were taken from all parts of the cortex, the basal ganglia, midbrain, pons, medulla and spinal cord and stained with toluidin blue, cresyl-violet, hematoxylin and eosin, Weigert and Sharlach R.

The meninges showed in places a slight infiltration with round cell elements consisting of lymphocytes and a few plasma cells, but nowhere was this very intense (Fig. 2). The cortex itself was devoid of pathology except a few petechial hemorrhages which were fresh and were probably agonal. The medulla oblongata showed but a few vessels whose adventitial lymph spaces contained round cell elements, while the spinal cord was entirely normal. In the pons the evidences of encephalitis of the epidemic type were present as shown in Fig. 3. It was in the midbrain and in the basal ganglia that the pathology was most marked. In the latter the thalamus was most intensely involved and in places the thalamic structure was almost unrecognizable as shown in Fig. 4, where the infiltrating cells are seen not only around the vessels but in the tissue substance itself with a disappearance of many of the thalamic ganglion cells. In the striate body the evidences of encephalitis were present but to a much less degree. In the mesencephal the substantia nigra was particularly involved resulting in an almost complete disappearance of the normal pigmented cells with replacement with lymphocytes and glial nuclei as shown in Fig. 6 (compare with Fig. 5, which is the normal substantia nigra at about the same level). Perivascular infiltration was present here also and Fig. 7 illustrates the proximity of such a vessel to the emerging fibres of the third nerve and gives the probable explanation for the frequency of partial third nerve symptoms in epidemic encephalitis where a localized meningitis in the interpeduncular space is not present.

CONCLUSIONS

1. We have observed a case of epidemic encephalitis showing extreme muscular hypertonia, rigidity and catalepsy. We were able to demonstrate that severe localized lesions of the striate system are capable of causing this amyostatic syndrome. We believe that patients of this type that recover will show paralysis of automatic association movements, rigidity, tremors or other residual Parkinsonianlike forms. We are of the opinion that the immediate prognosis in this type should be guarded and that this represents a severe type of disease, but recoveries have been reported.

2. Generalized hypertonus of the muscular system is a frequent symptom of encephalitis. It may reach a degree sufficient to cause the patient to maintain given positions or catalepsy. It seems usual for this type to have choreiform movements early in the disease followed by stupor, muscular rigidity, hypermyotonia and cataleptoid phenomena.

3. This hypermyotonia with rigidity should not be mistaken for a schizophrenic reaction. The history with evidence of a febrile infectious process, the association of cogwheel resistance, rigidity, tremors of a paralysis agitans type, myoclonic twitchings or other neurological signs with the spinal fluid examinations should differentiate the case from catatonic dementia precox while the absence of other schizophrenic phenomena should make the diagnosis certain.

262 South Twenty-first Street.

The author's references will appear in his reprints.

The Incidence of Acute Epidemic Encephalitis in Bellevue Hospital in the Months of January, February, March, 1923

By RAYMOND S. CRISPELL,

New York.

In the first quarter of 1923 there was discharged from Bellevue Hospital a total of fifty-five patients on whom the diagnosis of epidemic encephalitis was made. This does not include the admissions of encephalitis during this period, which would probably bring the total above that given. Neither does it include the discharges from the psychopathic division of the hospital, which keeps its records separately, but which also had its share of admissions of encephalitis. When one compares the total admissions in 1921 and 1922 of encephalitis with those in the early months of 1923, one can see that there was a mild recrudescence of the epidemic of encephalitis in this period. In the whole year of 1921 there were but fifty-one cases signed out as encephalitis, while in 1922 there were but sixty.

On reviewing the fifty-five cases which were signed out epidemic encephalitis in the first quarter of 1923, six cases were ignored because they were chronic encephalitis, that is, the acute stage had been passed months ago. Seven cases were not considered because of insufficient evidence of encephalitis, usually on the basis of insufficient stay in the hospital to confirm diagnosis. This leaves forty-two cases which are the subject of this review.

As to age, the majority of the cases occurred in the third and fourth decades. The three incidences in which the diagnosis was made in children were all fatal. One patient was seventy-two years old.

It is significant that in only five cases was it noted that the patient had a preceding attack of influenza or any other respiratory disease. In twenty-six cases the onset was gradual while in nine it was sudden. In the majority of cases the onset was attended with neuralgic pains, which often lasted throughout the disease and into the convalescence. The most frequent sites of these pains were the back of the head, the neck, and down the arms. In twenty-four cases these neuralgic pains were specifically mentioned. Among the other localities affected were the chest, lumbar region and abdomen. Several cases mention pain in or around the orbits. Most of these neuralgic pains were radicular in type and distribution.

The most common symptoms were those referred to disturbances of the extrinsic movements of the eyes. In twenty-five of the cases it was mentioned that the patient complained of diplopia, or what is interpreted as its equivalent, blurred vision. Whether or not ocular symptoms are a *sine qua non* of epidemic encephalitis is not agreed upon. In this series of forty-two cases it was not mentioned in seven cases. Ptosis is a frequent symptom and is mentioned in ten of the cases. Strabismus or weakness of the external rectus muscle was present in eight of the cases. Difficulty in convergence and also in looking upward is frequently mentioned, but this has been found to be a very unreliable sign in encephalitis because it is difficult to determine and is often so debated. Nystagmus is mentioned in ten of the cases.

As to the intrinsic movements of the eyes, sluggish pupils were present in ten cases. In but one case were irregular pupils noted, and it is considered that in this case, the irregular pupils were independent of the epidemic encephalitis.

The various disturbances of consciousness and the psychical reactions are for convenience placed in the cortical manifestations of the disease. Insomnia, especially at the beginning of the disease, but often lasting throughout, was very frequent, being a complaint of ten or more of the patients. It is curious to note that the word lethargy was rarely used in describing the general condition of the patients, being present in only two of the histories. The general condition of the patient was described as somnolent, stuporous or apathetic in fourteen of the cases: Delirium or clouded consciousness was present in ten of the cases. In one of the cases the patient was in a comatose condition upon admission to the hospital. In one or two cases a difficulty in concentration was mentioned. A number of the cases went through many different phases of disturbances of consciousness. For instance, in one case it was described that at first the patient was sleepless, later his consciousness became slightly clouded or was somewhat slightly irrational, but still later he appeared to be in a profound sleep. In one case there was a marked euphoria.

Except for myoclonic twitchings, there was little mention of adventitious movements. Tremors of the hands were present in four cases, in one of which the whole body was said to have been tremulous. In one case there were tremors of the mouth and jaw. In two cases there were choreiform movements, with the necessity of a differential diagnosis between encephalitis and chorea. Parkinsonian facies were not prominent, being mentioned in only twelve cases, possibly because it is not apparent early, or possibly because the examiner believed he had covered it in describing the general appearance of the patient as mentioned under cortical manifestations in this paper. In nine cases unilateral facial weakness is mentioned. However this is probably as unreliable a sign as the difficulty in convergence and for the same reasons.

Dizziness was complained of in a few cases. This is interpreted by some of the earlier writers on encephalitis as irritation of the vestibular nuclei. But this was not borne out by evidence of involvement of other grey masses in that neighborhood in this series of cases and one would suggest that it is the result of the general irritation of nervous functions found in many infections rather than the specific irritation of the vestibular nuclei.

Autonomic symptoms, described at length by some writers, were not prominent. Difficulty in micturition occurred in several cases. Difficulty in swallowing and increased salivation occurred in only one case each.

No case of the forty-two showed any pyramidal signs, with the possible exception of several in which the abdominal reflexes were questionably absent.

In three cases a slight suggestion of rigidity of the neck was noted. In only one case was the neck described as rigid.

As diplopia was the most common subjective symptom, myoclonic twitchings were the most constant objective sign. They were definitely noted in twenty-three cases, most commonly in the abdomen, but also in the extremities. In several incidences myoclonic twitchings were the outstanding factor in the cases and the factor on which the diagnosis of epidemic encephalitis hinged.

Three of the cases were considered in the subacute stage and were afebrile. Of the remainder all were febrile, or more correctly speaking subfebrile, since, in the majority of the cases the temperature did not rise above 101°. Higher temperatures offered a poor prognosis for in the ten cases that reached anything over 102° seven were fatal. In two cases temperature was subnormal. In one case it was striking, reaching 96° and averaging around 97°. In this case the pulse was at the same time rapid (80-120), giving a peculiar temperature-pulse ratio. This was the only case in which the pulse went down as the temperature went up, a phenomenon that has been described. Judging by this series of forty-two cases the pulse is not outstandingly rapid in encephalitis, but is in proportion to the temperature as in other infections.

The leucocyte count averaged between 11,000 and 12,000 and increased only slightly with the other evidences of increased severity of the infection. The three cases having a count of 20,000 or more were fatal.

A slight pleocytosis was the only constant spinal fluid finding, averaging 20-30 cells. Cell count was recorded in only twenty cases, in five of which it was within normal limits. The highest count was 120 cells.

Twelve of the forty-two cases were fatal. The number and results of the postmortems were not traced. In at least two cases it is known that the postmortem verified the diagnosis. Six cases were signed out unimproved, twenty-two as improved and two as cured. In this connection it is debated among neurologists as to whether or not epidemic encephalitis is ever wholly recovered from, or if a detailed examination would not reveal some sequel or residue. It is the impression of this clinic that relapses are fairly common. No recurrences have been noted, that is, a revival of evidences of the disease after the patient has been signless and symptomless, or practically so, for some time.

Six cases were treated with Rosnow's serum with indeterminate results. One was treated with her own spinal fluid intravenously, with a satisfactory course. In the rest of the cases the treatment was symptomatic. Intramuscular injections of ether for the relief of the myoclonic twitchings were tried with no more definite results than from the subcutaneous injections of eserine for the same purpose.

Psychoanalysis, Its Theory and Technic*

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At the present time no apology is needed for bringing up the subject of psychoanalysis for discussion before medical men. Psychoanalysis fought its way to recognition slowly, after much criticism and derision were levelled against it. To be sure, occasionally, here and there a voice is raised against the sexual theory of the neuroses, but physicians have become tolerant and inclined to take a more sober view of psychoanalytic disclosures. It is natural that a theory and method so revolutionary should have met with such opposition, for it arouses slumbering thoughts in one's own unconscious which makes meditation about such subjects a rather unpleasant occupation.

I propose to present the psychoanalytic theory of the neuroses leaving out demonstrations from personal observations, for I am sure that the views of Freud which have as a basis the combined experience of workers throughout the world are far more convincing than any isolated experiences of one's own as a contribution in this field. It is therefore a digest of facts and theory which I am about to present to you for discussion.

The cornerstone of psychoanalysis is Freud's theory of the unconscious. That there are unconscious phenomena in our mental life has been known long before Freud, but his conception of the unconscious differs from the connotation given to it by previous investigators. It is not the unconscious which results from the mere frequent repetition of activities that they in the end have become automatic, hence no longer consciously performed. The unconscious in Freud terminology is a special mental realm where are stored up memories and recollections which had to be repressed or banished from conscious thinking on account of their unpleasant character, or activities which have likewise been repressed because of their immoral or antisocial tendencies. We have to consider with Freud that certain activities in childhood, as well as certain phantasies in this period of life are being constantly censored and inhibited by those about and this repression is especially severe where the sex activities of the child are concerned, not only excitation of the genitalia and onanistic practices but the child's curiosity for sex information, his love of exhibitionism, thumb sucking and other perverse activities. Usually when the child is caught in any of these performances, the rebuke is so stern that he realizes that he has done something wrong and the whole incident is frequently repressed into the unconscious, so that a complete amnesia of the occurrence results. These earliest repressions form the deepest stratum of the unconscious and inasmuch as the effects connected with such experiences are capable in the near or remote future to give rise to a neurosis, the psychoanalytic investigation, in order to be thorough and complete, must take into account the possibility of such early experiences, and devote time to them.

In later life, during adolescent and adulthood all experiences which lacked the means of being realized or whose realization was opposed strongly by contrary motives, are also repressed into the unconscious. Observe here that such activities as are repressed are in their nature pleasant desires or activities, and that the repression is the result of antagonistic impulses, some tending to favor the expression or giving free rein to such tendencies, others to suppress them, violently if necessary. The triumph of the suppressing force does not mean any more than the fact that a temporary overwhelming by a superior force has been achieved, but the wishes nevertheless continue to exist in the unconscious, are forever striving for conscious expression, but are repeatedly being prevented from doing so by repressing tendencies which must be constantly on the watch. Such suppressed desires, however, manage to manifest themselves either in dreams, as disguised or undisguised wishes, or as symptom formations in case a neurosis results in the future. Analysis has shown that nearly all suppressions have to do with sex activities, for no other instinct has suffered so much repression. Freud singled out for his study the sexual instincts, not because of any predilection, but because in his investigations of the neurotic symptoms he was constantly confronted by sex notions, sex phantasies and sex experiences as the most obtruding material in the lives of the neurotics. Anyone who has had occasion to observe the behavior of an hysteric during a convulsion cannot be left in doubt as to the nature and meaning of this hysteric manifestation—in the feeling of languidness, tingling and faintness, often mingled with anxious expectation, in the character of the bodily movements, the feeling of relaxation and the act of crying following the convulsion there is reproduced the typical sexual experience of the first coitus. Charcot has described passionate attitudes in the hysteric which are unmistakably grossly sexual. That, also, in the traumatic neuroses, the real trauma is, not the injury sustained, but the traumatic fixation of instinct, or that the disease is the result of the uneven or unsuccessful struggle which the libido (or sex urge) has waged against the moral forces, has been abundantly proven by analysis of traumatic neuroses in civil and military life.

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*Read before the combined meeting of the Queens County Medical Society and staff of Jamaica Hospital, June 18, 1923.

We have already stated, that analysis of neurotic patients forced upon us the conviction that their symptoms represent substitute formations for erotic wishes that could not find *expression in reality* for the reason that such desires were incompatible with the demands of cultured society. A neurosis, then, cannot arise unless such a moral conflict precedes it, the contending forces—sex demands and ego demands—finally compromise, with the result that the idea or incident suffers repression into the unconscious, but the affect belonging to it, representing as it does, a quantum of psychic energy, is transformed into motor activity or sensory innervation. According to this conception, hysterical paralysis, for example, results when the liberated energy is employed in blocking the pathway for motor innervation; or paraesthesias from the utilization of such energy to cause sensory irritation, etc. Since repression always follows psychic conflicts in neuropathic individuals, the final end-process—the symptom formation—its *raison d'être*—is entirely unknown to the patient and it can continue as a symptom only so long as it remains unconscious; for a cure results when the whole process becomes conscious.

To understand the rôle sexuality plays in the causation of the neuroses it is necessary to trace the normal sexual development in childhood and adolescent life, and the many deviations or arrests which this instinct is liable to suffer in the various stages of its development. In his *Three Contributions to the Sexual Theory,* Freud outlined his ideas concerning the development of this instinct. It would appear that the sex instinct, or rather one of its components, makes its appearance very early in infancy, that many of the activities of the child must be construed in terms of sex—if by sexual we agree to adopt Freud's broad conception of it. Viewed in this light, mouth and anus, in fact any sensitive skin area capable of giving rise to pleasurable sensations, are to be regarded as erogenous zones. These are sources of sex activities long before the genitalia become the chief instruments of such gratification. As the child develops, manifestations of the instinct become centred about the genitalia and masturbation is the result. In the further development of the individual, masturbation is relinquished for normal coitus. It is, however, possible for any of these intermediate stages of sex development to become arrested, either partially or wholly, and the result will be a fixation of the instinct which clings to life. Unnatural sex gratification and perversities take their root in these fixations. Observe also, that in connection with the development of these gross sexual instincts, there goes on a similar process of development in the higher sex expressions—I mean love. The first attachment of the child is toward his parents, with a preference toward the parent of the opposite sex, the girl clinging toward the father, the boy instinctively loving the mother, and there is abundant proof that such feelings are not as innocent as we are led to believe. Analysis of dreams of neurotics and even of normal people, show how frequently the socalled œdipus complex is an integral part of a neurosis, and that libidinous desires and phantasies toward the mother is common. No other statement of Freud has elicited so much condemnation as this one—the reason for such rejection, it appears to me, is twofold. Some people feel keenly that they themselves have had such notions in childhood, and the resistance they manifest toward this theory is transparent; secondly, the majority of mankind has so effectively outlived such infantile tendencies and fancies that they cease to be reckoned with later in life. The normal does not attract us and we are cold toward that which seems to bear no consequences. It is only the pathological which arrests our attention. Freud was compelled to introduce the consideration of the œdipus complex because analysis has shown that this pathogenic complex regularly exerted an influence on the life of the neurotic—in other words, that he never effectually outlived his earlier infantile attachments. The normal youth, at about puberty, gives up his love attachment to his mother as the sole object of his affections and transfers his sexual feelings toward an object outside of his immediate family.

Freud has also emphasized another stage of the sex development of the individual—the narcissistic stage. In this stage, which follows immediately the oroanal stage, the child finds greatest satisfaction in the admiration of his own body. When the further development is hindered by some accident, the narcissism may color the whole life of the individual. We find it especially in those selfish, selfsatisfied, egotistic individuals who exhibit so little regard for others. In the psychoses we see them exemplified in the dementia precox and paranoid groups. These patients exhibit an utter lack of libido attachment toward others, are boundlessly egoistic, selfcentred, egocentric, totally lacking in feelings of sympathy for others, in social sense and duty, are devoid of feelings of responsibility, hence are slovenly, lazy and indifferent. In connection with fixation of instinct, we must familiarize ourselves with another process known as *regression,* by which term we designate a return to an earlier stage of sex activity. A woman, for instance, may be forced to adopt masturbation as a means of sex gratification if a normal outlet is prevented either by reason of nonmarriage or rejection of illicit sexual intercourse. Though physiologically permissible in childhood period, masturbation is not the mode of sex activity of the normal adult, and regression thus becomes a return to infantile sexuality.

Having gained some insight into the nature of the unconscious, of the processes of sex development and the probability of their being arrested or fixated at any period of development, these fixations serving as points which later may manifest themselves as part symptoms of a neurosis; after having learned the meaning of repression and the nature of the repressing force, and of the process known as regression, we will turn our attention to the consideration of the psychoanalytic method.

If our theoretical considerations are correct, the cure of a neurosis will consist in removing the resistance by which the suppressing force holds the traumatic occurrence in the unconscious; by thus rendering conscious what has previously been unconscious, the incident is freed of its pathogenic effect. The aid given by the analyst consists solely in guiding the patient to the solution of his own conflicts, and unless the explanations and interpretations offered to the patient are accepted by him in the sense that the connection between his symptoms and complexes, which for a long time lay submerged in the unconscious, are fully realized and the whole process carries conviction, the patient is not cured.

Psychoanalysis makes use of the method of free association; the patient is directed to tell everything that comes to his mind without exercising any choice whatever in respect to what he reveals. Thought is thus removed from all hindrances, there is no goal, no aim, no guiding idea. Since the repressed thoughts and desires are constantly striving to become conscious, the manner of free association affords them the easiest way to achieve their purpose. They manage to reach consciousness, however, only in a distorted and disguised form, because consciousness is not ready to countenance the naked truth. Only when the patient is in a position to take up the struggle anew, which the aid and preparation of the analysis has made possible, can the battle be fought over again in the open with good chances of success.

Freud was led early to the study of dreams and he found them of the greatest value in the investigation of the neuroses. The dreams of neurotics are the keynotes to the disease, to the probing of their unconscious. Freud regards the dream as a psychic process full of meaning, the dream never concerns itself with trifling matters but with subjects of tremendous importance to the individual. The dream, as it is revealed to, and remembered by us on awakening, is the manifest content, while the ideas free association lead us to is the latent content. The dreams of the neurotic can be regarded in the same light as his other symptoms, that is, they are manifestations of censored wishes which, on account of their incompatibility with the rest of the personality, had to be repressed.

Again, the repression has to be steadily applied, since the wishes show a tenacious persistence to break through the threshold of consciousness. However, they do not succeed in becoming conscious except in a disguised and distorted form.

There are several details about dream formation and analysis which it is important to keep in mind:

1. The dream represents ideas and situations by means of pictures—a sort of visual hallucination.
2. The dream generally fuses many occurrences into one, a process spoken of as condensation.
3. A process, the reverse of the latter and known as overdetermination, occurs, in which a single element in the latent dream thoughts may be represented by several scenes in the manifest content.
4. Displacement, a process the purpose of which is so to distort the latent dream thoughts as to render them suitable for conscious apperception. This is accomplished by shifting of the accent from an important event to an unimportant, or the affect may become displaced from its proper setting and attached to an indifferent occurrence.
5. Symbolization. A little reflection will show us the close similarity between dream and neurotic symptom; the symptom is a projection outward of an inner conflict, the dream is likewise a distorted expression of a prohibited or an unrealized wish. In both instances the same mechanism operates: Inner conflict, repression, a striving to find expression which is only achieved when the ideas undergo distortion, displacement, condensation and symbolization to such an extent that the obvious meaning is unrecognizable, and thus can reach consciousness. The analytic technic aims to remove the resistances by which the ideas are prevented from becoming conscious. It lays bare the nature of the psychic conflict and thus frees the whole process of its mysterious background. The fundamental purpose of the dream is the realization of an infantile wish. This statement of Freud is not only supported by analysis of dreams but is also in agreement with a profound mass consciousness which expresses itself in the saying—"In my wildest dreams I would not have anticipated that," thus attributing to the dream a definite aim—that of bringing satisfaction to our deepest yearnings and aspirations.

Analysis of dreams is frequently difficult. The more formidable the repression is, the greater will be the distortion. Though an intelligent patient may furnish much material which would enable one to interpret the dream, it requires considerable experience and adroitness to do analysis ably. The immediate excitants of a dream are significant occurrences of the day, but analysis of the latent content reveals numerous reminiscences of the past, often exceedingly remote, reaching into childhood experiences, all the material undergoing elaboration, displacement and condensation to form the manifest dream. The motive of the dream is the realization of childhood desires and aspirations and yearnings of later life. The distortion which the dream thoughts suffer may also relate to the affect of the occurrences. It may be left out entirely or the effect may be transposed to an indifferent occurrence or personality, which may render the dream unintelligible, or the dream work may make use of symbolism to hide the meaning of the latent thoughts. Symbolism is a likeness, close or remote, which can take the place of the original.

We make use of symbols to express ideas in a concrete form and to disguise the meaning when direct connotation is inadmissible or inappropriate. Wit and humor frequently clothe themselves in symbolic expressions. Especially rich in symbolism are sex ideas and thoughts, for the reason that our social morality has placed restrictions upon uncensored sex expressions. Analytic philology has thrown much light on the origin of symbolism and the study of folklore has equally contributed toward the understanding of this strange mode of representation. There is one more process which I would like to mention before closing. The process I allude to is known as transference and the importance of the subject can be inferred from the fact that curable neuroses are known as transference neuroses, in contradistinction to those incurable mental affections in which transference does not take place. These latter are spoken of as narcissistic neuroses. Briefly, by transference we designate an ability to project the libido onto an external object. In the course of an analysis the physician soon notices that the patient becomes interested in the personality of the analyst and finally transfers to him all the feelings and sentiments, friendly and hostile alike, as if, in the patient's phantasy, the physician assumes the rôles of all those against whom these emotions were originally directed. This is what actually takes place and it serves the purpose of reconstructing anew the neurosis, by the patient's going through the various stages of it again. The physician is face to face with an acute exacerbation of the symptoms, but the sexual life of the patient being known to him, as well as the suppressions which the libido has suffered, he is able to direct the storm to a successful issue.

I am near the end of my paper. It is needless to say that I am peculiarly conscious of its imperfections and limitations. One supposed objection already stated I will try to answer. It may be said that I offered not a single clinical proof of any assertion I made. I am not, however, conscious that by the elimination of case descriptions anything has been lost of the validity of the presentation of the subject. The conclusions and theories of psychoanalysis have been arrived at from strictly clinical observation. The introduction of a few more cases would not add anything substantial to the subject but would tend rather to obscure the whole by unnecessary detail.

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Aseptic Meningitis in Combating the Dementia Precox Problem

A Preliminary Report

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BAFFLING NATURE OF DEMENTIA PRECOX.

A generation ago pulmonary tuberculosis was the dread of the internist. Certain forms of cancer, today, are the despair of the surgeon. Even so, since mental diseases have been classified, those forms which by the Kraepelinian school have been designated dementia precox, or schizophrenia under the Bleular classification, have been the *bêtes noires* of the psychiatrist. To diagnose precox has been, at best, to condemn the victim to a life of sadly reduced efficiency; even today, for the majority, it carries a life sentence of narrowed institutional existence. In vain have scientists, the best of our age, in laboratories lacking no item of perfect equipment, labored in sincerity, in detail, in effort beyond lay belief, labored to exhaustion.

CONFLICTING THEORIES.

Long since, our profession laid the ghosts of superstition, ignorant and orthodox, as to the causes of insanity. The curse of the voodoo, the baleful addling of the moonbeam, the displeasure of the Almighty, alike have given way to efforts to rationalize. Heredity has been accused of cheating the dementia precox patient, of giving him a mentality of mushroom quality which reaches its apex of ability early and early recedes.

The internal secretions, in the very seminebulosity of their real chemistry, in the intricate nature of their physiological activities—how tempting to associate the indefinite with the indefinite! I have diligently theorized and therapeuticized along the lines of perverted thyroid, disturbed parathyroid, deficient sex gland, broken hormone balance, with few results which could not be traced to improvement following general metabolic elevation and better habit formation through constructive custodial influence.

Gastrointestinal intoxication has for years claimed an important seat on the rostrum of reasonable theories. The dementia precox bacillus was almost isolated! Colons have been ablated and, without doubt, gastrointestinal hygiene, including a lowered protein intake, has appealed favorably to many practical workers. Today, focal infection has joined hands with autointoxication and thousands of sepsis breeding teeth and foul tonsils are being removed with unquestioned aid to the disease fighting forces. To these somatic theories can be added that of choroid-plexus inadequacy. This would make possible, through the reduction in choroid plexus integrity, a defective cerebrospinal fluid. Probably the most favored theory today of the majority who accept a biochemical basis for precox might be stated as the combination of autointoxication, septic focus and choroid plexus insufficiency.

But the suggestion of complexity turns us toward a confident group—the many who sit in high places and teach the psychogenetic basis of this dread disease. The pendulum has indeed swung far, in the psychic department of science, in this acceptance of the power of mind over matter. And truly great has been our understanding of complexes, transferences, sublimations, blockings and mental disorganizations generally, which result from the patient's inadequacy to meet the intricacies of civilization. Moreover, psychoanalysis has stimulated professional contact with patients, suggestive, persuasive, analytic, undreamed before in the treatment of precox. And these efforts have often been fruitful, even as have surgical, special dietetic and more direct reeducational methods. But in face of long continued physio- and psychotherapeutic efforts of rarely equipped minds, there exists today no absolute road of approach to this dire problem.

ASEPTIC MENINGITIS.

We have passed by another theory which excited some of us about ten years ago, when Lundvall, of Sweden, observed in some of the dementia precox cases under his care a leucopenia when his patient was losing ground, and a hyperleucocytosis during improvement. Many of us then recalled instances of startling remission in even quite advanced cases recovering from septic infections and showing an active leucocytosis. In 1895 Dr. Adolph Meyer had written: "Whether, indeed, the lucid intervals and rapid improvement of torpid cases after infections which produce leucocytosis (typhoid fever, tuberculosis, suppuration, and other conditions) might be due to the fresh regenerative impulse, will be a question worth examining" (1).

Dr. Bayard Holmes then wrote an article suggesting the use of nuclein in the arrest of dementia precox, and numbers of psychiatrists used Lund's solution of nucleinate and cinnamate of soda with arsenious acid injected intramuscularly to produce a plethora of leucocytes. But it was soon found that these aggressive repair cells when lacking pathogenic material to feed upon turned to the normal red cells for pabulum; and that a secondary anemia was thereby scientifically produced. Since then little has been heard of hyperleucocytosis as a therapeutic agent for the alienated.

In January of this year in a mental tilt with the problem, following the reading of Dr. Charles E. Dowman's paper, Trans-Choroidal Therapy in Neuro-Syphilis; Preliminary Report, based on the work of Mehrtens and MacArthur, the thought came of an injured choroid interfering with normal chemotaxis, and that, perchance, dementia precox might prove a food-chemico deprivation, rather than a toxic destructive process. In pursuance of this theory, and in hope of restoring choroid permeability, Dr. W. W. Young, our resident physician, removed twenty-five c. c. of laboratory normal cerebrospinal fluid by lumbar puncture, and replaced it with an equal amount of inactivated horse serum in a case of marked catatonic stupor. The symptoms of an aseptic meningitis followed. No mental change was observed. A week later a second treatment was given. The next day the patient was quite himself for the first time since his admission.

In our unfortunately all too short series of cases, the seven day interval has been most satisfactory. A minimum of two, a maximum of five injections have succeeded in producing either temporary or permanent lucidity in every dementia precox case thus treated. The temperature usually reaches a maximum of 102.5° with no untoward disturbances of pulse and respiration. Backache and headache are present for thirty-six to seventy-two hours, and nausea, sometimes vomiting, may be expected during the same period. It is common for the patient, during the height of his discomfort, to prefer to stand or lie with his back pressing against a hard surface. A slight strabismus, herpes labialis, generalized urticaria, and an anaphylactic threat with expiratory dyspnea have been observed following a few of our over sixty injections. In most cases, temperature, pulse and respiration have returned to normal within three days.

The laboratory findings are of greater interest and, we feel, most significant. The monograph of papers from the Army Neurosurgical Laboratory, issued by the Rockefeller Institute, March, 1920 (A Study of Experimental Meningitis), is an exhaustive exposition of various forms of meningitis, including those produced by foreign sera. In these experiments over twelve hundred cats were used. An excellent idea of the margin of safety can be derived from this monograph. In cats it was shown that a pleocytosis amounting to even 6,000 per c.mm. was produced by horse serum within eighteen hours following spinal injection. We have found an average cell count of 100 or more per c.mm. in fluid removed even fourteen days after an injection. The phagocytic activity of this even two thousand per cent. increase must be obvious. The presence of from one to eight per cent. of eosinophils, unique, so far as we have been able to ascertain, in any other condition of the cerebrospinal fluid, possesses a significance at present unknown to me. It is possible that the eosinophils develop in an effort to neutralize the foreign proteid contained in the serum. It is theoretically possible that the precox disordered protoplasm contains chemicals which the acidophilic eosinophils possess a power to neutralize or appropriate. We have observed that the larger percentage of eosinophils has been found in patients making the most satisfactory response.

The usual cell count in spinal fluid removed during treatment is: Mononuclear lymphocytes, 95 to 89 per cent.; true phagocytes, 4 to 6 per cent.; eosinophils, 1 to 5 per cent.; neutrophiles, 0 per cent.

Of most profound interest to us, however, are the mental reactions. Little or no change has been the rule following the first treatment. The appreciation of reality, in recent cases, has always developed by the fourth injection, usually by the third. In those with hebrephrenic or catatonic symptoms of from four to six months' duration the response has been more permanent. In chronic cases, those with precox histories dating back three to six years, the reactions have been paradoxical. One patient who had been destructive, resistive and untidy for thirty months; in whom precox symptoms had been observed for six years; who had been mute for practically one year, asked intelligent questions concerning the treatment within two hours. It was found that this girl's contact with reality increased until in thirty hours, when the artificial leucocytosis is at the peak, it would have been difficult to detect any abnormality in her conduct or conversation. With little help she disclosed the mechanism of her delusions, admitted her hallucinations, discussed them as a symptom, wondered at her helplessness in control of them. Then the slow reclouding until at the end of a week she was quite shut in. This case's reactions were largely hebephrenic.

In contrast is a young man with a four years' psychosis, diagnosed as hebrephrenic precox by Dr. Archibald Church at the Chicago Psychiatric. During the last ten months increasingly catatonic reactions alternated with stupor and periods of panic. Four spinal treatments with one week intervals produced no results. The day following his fifth he was arrayed and in his right mind. He has remained well.

Again because of our limited number of chronic patients we are unable to record the probable other forms of mental response to this treatment.

TENTATIVE THEORY.

Should we formulate our present theory as suggested by our results to date, we would state that by removing an average of twenty c. c. of cerebrospinal fluid and replacing it with an equal amount of inactivated horse serum, an aseptic meningitis, with a tremendous production of leucocytes results in all cases—far more than is necessary to rid the fluid of the irritating foreign proteid which has been introduced. This leaves an overplus of phagocytic energy in closest contact with neurone protoplasm, energy available for possible scavenger and reparative action on brain tissue, probably on choroid plexus. Through this method of approach Nature's most perfect remedy, her own reparative cells, can be actively and persistently kept in contact with previously injured brain protoplasm. Deadening and damaging toxins may thus be neutralized; and if regenerative processes within the brain are possible, the most perfect stimulation to that end is thereby provided.

Again to quote Dr. Meyer: "In comparing cells with possible degeneration in a terminal dement with those of more acute changes with leucocytosis one cannot help being impressed with the idea that the leucocytosis offers more favorable outlook, and the laws of its influence would be worth continued experimental and pathologic research" (1).

Case I.—Mr. J. C., aged twenty-three years. Tenth grade common school. Clerk in country store. Hypochondriacal ideas developed early in 1922. Became "worried about things." Sleep poor for some months. Suspicious, believed his food was poisoned; that his companions read his mind. Evinced vague auditory hallucinations. Admitted to Highland Hospital November 19, 1922. Quite inaccessible, catatonic rigidity, negativism. A catatonic stupor developed rapidly. Our first use of this method of treatment was made in this case January 15, 1923.

Thirty c. c. of clear, apparently normal spinal fluid were withdrawn and an equal amount of serum injected. During that week short periods of lucidity appeared. On January 22nd the treatment was repeated. The fluid now withdrawn, with no sign of increased pressure, was found slightly clouded and had 105 cells per c.mm. Temperature went to 102.8° and gradually decreased to normal. On January 24th the patient's father came to transfer him to a State hospital. The boy who had previously shown no insight protested that he had been very sick and was getting well; indeed quite convinced his father of the hopefulness of his condition. During the following week he read three novels and discussed them with interest.

On February 7th he received a third treatment because of the appearance of a mild depression. This was two weeks after the second, and 110 cells were still present. Following this final injection, the patient's progress physically and mentally was most gratifying. A nice sense of humor, a remarkably clear insight into his illness, a willingness to carry out the dietary and vocational routine planned for him, expressed his purpose to help himself. An out of door regimen of eight hours' work, gymnastics and play was followed for weeks without objection. The patient developed excellent skill in baseball, becoming one of the best hitters on the hospital team, and was dismissed on May 15th to return to his home with every evidence of normality. In this case we were treating a very recent psychosis and secured most gratifying results. A letter from the patient dated August 20, 1923, tells of a busy, normal summer.

Case II.—Miss N. E., aged twenty-three, had completed her freshman work in a northern university, and was considered brightest in the family, with a mind "specially keen." She was doing stenographic work in a physician's office when she became irritable. Short periods of excitement alternated with days of apathy. Delusions of unworthiness, ideas of persecution, objectless laughter, illogical repetition, emotional incoordination, confusion and hallucinations appeared. Diagnosis of hebephrenic precox made by Dr. H. Mason Smith, of Tampa. Upon her admission, January 3, 1923, marked apathy was interrupted by short periods of panic. Cyanosis of hands and feet was almost constantly apparent. Patient was disoriented as to time and place, and the days passed without interest or accomplishment.

On February 20, 1923, a lumbar puncture was done and twenty c. c. of fluid withdrawn and replaced by the same amount of horse serum. Temperature rose to 102° F., subsided in forty-eight hours. February 28th same treatment. No alteration in behavior apparent. March 7th, third injection. Cell count 110. Two per cent. of eosinophils were found in a stained cerebrospinal fluid smear. Patient became normal in conduct and remained so for eleven days, then clouded somewhat. March 22nd the fourth treatment was given, fifty-four cells being found at the end of this interval. On April 2nd the final injection was administered. One hundred and ten cells were present with six per cent. of eosinophils. It is noteworthy that the patient cooperated fully in this last treatment, recognizing then, for the first time, her need and the benefit she had received. During the two weeks following there were periods of rather normal homesickness and reasonable anxiety about family finances. Unfortunately, on April 16th, the father, younger sister and a physician relative, on their way north, visited the patient. They united in considering her so improved that further treatment would not be needed; and in the face of the gravity of the diagnosis and our statement that her mental future was still decidedly in the balance, they took her to her home in New York State. Needless to say, the transformation in this patient's mental condition which influenced the family's decision had been a remarkable one. Still later reports tell of continued gain, of plans to resume her duties October 1st.

Case III.—Mr. P. M., aged twenty-nine at the date of his admission to Highland Hospital. Salesman in a department store in Chicago; two years high school education. As a private in the engineers, was at Camp Grant four months and in France from September till June following. Was popular as a salesman and in the army. The January after his discharge, ideas of persecution, growing apprehension and auditory hallucinations developed. In May, 1920, he practically held up traffic for four hours by perching himself on the ledge of a fifth floor window in the Auditorium Hotel in Chicago, threatening to jump if molested. A fire net was held in readiness for nearly two hours while a friend was brought across the city, who from the window of the next room coaxed him back to safety. The diagnosis of hebephrenic dementia precox was made in the psychiatric department of Cook County Hospital, and on June 21, 1920, he was transferred to Highland Hospital.

For three months his interests remained most narrow and shallow. His responses were inconsequential, his apathy almost continuous. Under out of door therapy, absence of nicotine and a low protein diet he slowly emerged and six months after his admission had become quite social. His interests multiplied, though his intelligence standard never returned to the normal. For one year he did simple attendant's work in the hospital. But during the early summer of 1922 his freedom was necessarily restricted following aggressive attempts at assault on two negro maids and a nurse. Then delusions, bizarre and mixed, appeared, slowly and, to all appearances, irrevocably intensifying, until all responses disappeared and he lay day after day in a state of unrelaxed tension. Dr. Hohman, of Phipps Clinic, seeing him, spoke of the case as specially hopeless, noting particularly the constant tension of the flexor muscles of the neck with the persistently semielevated head.

February 16, 1923, the treatment outlined above was administered. Cerebrospinal fluid showed five cells to the c.mm. Treatment repeated February 27th. This was followed by the most active reaction we had yet observed. Rectal temperature went to 104° F. Herpes labialis appeared. A slight convergent strabismus was present for four hours. Spinal fluid count had increased from five to 120 cells. Mentality uninfluenced. On March 12th, same treatment. Patient had been somewhat less stuporous during the preceding week. Eosinophils one half of one per cent. March 24th the fourth treatment. Two per cent. of eosinophils found in the 110 cells present. Patient had been more restless and had shown a few short periods of excitement in which his conduct quite resembled similar prolonged periods of a year before.

On March 31st the patient asked for his tooth brush, and has been mentally alert and rational since. Later, as he spoke of being "somewhat depressed," another and final treatment was given April 9th, cell count 105, eosinophils four per cent. Patient's behavior and mentality have since remained at normal levels.

Case IV.—Miss E. was a sensitive daughter from a home of refinement. She finished the first year in a Western university. Patient was twenty at the time of her mother's death. This loss was followed by some months of depression, when she was self-pitying, almost unsocial, and from which improvement was slow. At twenty-three she rapidly became apathetic, semimute and mildly catatonic. Following a dilatation and curettage under etherization and extensive pleuraglandular therapy, a quite satisfactory remission occurred and for eighteen months she was able to live at home, with the care of a special nurse. In the fall of 1919 hypochondriacal ideas were again expressed. These steadily deepened, while obstinacy and fears of contact developed. She was twenty-six upon her admission to Highland Hospital in April, 1920. Cyanosis of the hands was then noted. Hands and feet were damp, even wet, with perspiration. Dermagraphism was marked. Quite constant facial contortions, especially contractions of the frontooccipitalis. Patient was semimute, with no ray of insight. Sleep had been regular for some months. In view of the unsatisfactory nature of the symptoms the case was referred to Phipps Clinic, where she spent four weeks under observation. Returned to Highland Hospital June, 1920. Since then periods of catatonic excitement have alternated with weeks of hebephrenic apathy. For a year patient has been destructive, refusing her bed, has been tubefed for weeks, untidy in her habits, and mute save for profane outbreaks when excited.

February 9, 1923, the first treatment was given. Temperature went to 101° F. and for twenty-four hours the patient complained quite constantly of headache and backache. Her first rational utterance in months occurred two hours after the initial serum injection, when she turned to the attending nurse and asked, "Who gave me that treatment?" "Dr. Young," the nurse replied. "Why didn't Dr. Carroll give it?" she then asked. In explanation the patient had never seen Dr. Young until that morning.

On February 16th the second injection was given. Within twelve hours a nurse who had known Miss E. ever since her admission, after ten minutes' talk with her came out of the room as though she had been on holy ground and repeated, "I've seen a miracle." The very interesting feature in this case is that for twenty-four hours following the injection she showed the reactions of any wellbred society girl. She who had shut herself utterly away from all human contact, craved the association of others, clung to the doctor's hand and enticed him to stay by keeping up an adroit series of questions about his professional and personal interests; expressed discriminating affection for the nurses; was her beautiful, best, charming self. Then the fateful recession of this winsome personality, day by day, into the limbo of insanity. During her forty-eight hours of normalcy the psychoanalyst would have delighted in her eager cooperation in seeking out the underlying psychic factors. The family's "business had failed." She was a "pauper" and one of her family did not "take charity." She could not accept bed and board or attention from strangers. A genetic psychic element was found in her authenticated statement that her only real love had been for a married man. He being unattainable, what was "left to love"? Most rationally thus would she face and explain her complexes. A perfect opportunity was thereby afforded psychically to untie the Gordian knot. Following the third injection in which results were even more satisfactory and prolonged, further treatment was discontinued because of a sister's fear of dangerous complications. For two months, however, the patient ate normally, and, while deluded, talked freely and was entirely tidy in her habit.

Case V.—Mr. A. V. S., born 1893, completed two years in high school. Did work as chainman in an engineering corps for three years, then clerked in the cloak department of his father's general store for eight years. Was top sergeant during nearly two years in France. Drank some. Was fond of outdoor life. Was neat and dressed well, till the fall of 1918, when his habits altered. He drank heavily though irregularly, believed he had "a disease." Became inconsistent, remote and distant and increasingly careless in all his habits. In March, 1922, following a left herniotomy, he lost rapidly. In June had an unreasonable tantrum, with screaming. Began muttering and talked to himself almost constantly. He would count the months over and over again and repeat monotonously, "If I had only followed father, this never would have happened." He insisted he could never recover from the herniotomy though the result had been perfect. Restless habits were conspicuous. He bolted his food, left his trousers unbuttoned, refused to bathe, and at this time said he heard voices. He emitted hoarse throat sounds; many obscene expressions; had absolutely no insight; insisted that he should not be in a place for insane patients.

During his stay at Phipps Clinic some improvement in conduct was noted. Occasionally, however, he became very excited, yelling at the top of his voice. His best friends were unable to make contact with him during their visits. He would talk backwards. Stereotopy was marked. His affect was definitely incongruous, as he would laugh loudly and curse his girl friend at the same time. The final note in his Johns Hopkins abstract reads, "He became gradually more and more careless in his appearance, and therapeutic efforts had no effect."

He was referred to Highland Hospital, entering February 25, 1923. A strict reeducational regimen with low proteid diet and discontinuance of nicotine, and the advantage of many hours daily out of doors with a trained attendant, failed to alter the picture. On May 2, 1923, the treatment outlined above was instituted. The most marked reactions we have seen in our series occurred in this case. For twenty-four hours following the first serum injection, a giant urticaria invaded most of the skin surfaces. This responded within twenty-four hours to saline purgation and the administration of alkalines.

The second treatment was given May 29th. The patient was absolutely unreasonable at the time, shouting and screaming, practically incoherent. The spinal fluid count was 48 and the smear showed three per cent. of eosinophils, with many large vacuolated mononuclears and some containing pigment granules. For three hours after the treatment the patient was quiet, then became wildly delirious, absolutely inaccessible. Isolated convulsive movements developed with a marked bronchial spasm, an urticarial rash and an acute enlargement of the thyroid, indeed a smooth muscle tetany, which disappeared almost like magic under hypodermic injections of ten m. of one to one thousand adrenalin solution. Following this he slept quietly all night. Awakened the morning of the thirtieth, mentally normal and physically comfortable, and asked interestedly for breakfast. For four weeks a moderate temperature, irregular, with a perceptible weakening of the right external rectus, complicated his recovery. Indeed on June 9th he began vomiting; and in the presence of pressure symptoms he was given 100 c. c. of hypertonic salt solution intravenously, followed by prompt clearing, though temperature persisted between normal and 100° F. for three weeks longer. On June 29th spinal fluid was clear, chiefly small mononuclears, fifty cells to the c.mm., no pathogenic organisms, one per cent. eosinophils. The patient thus described his experience, "That second shot certainly straightened out my wits. Back of that it all seems a dream. I don't know today what made me do those fool things. I know now I have been very sick. I did not realize it at the time. That second shot certainly did the business."

On September 1st this patient was dismissed. Since May 30th he has been an absolutely different man, courteous, clean mouthed, considerate, a thoroughly good sport in his active out of door work.

In summarizing these cases, we find sudden and lasting betterment in one, gradual and satisfactory improvement in two with psychoses of recent date; a more delayed but apparently sudden reaction in the third case of longer standing; and in the most chronic one a remarkably prompt reaction, in which the normal was attained in a few hours, soon to fade slowly. We note, too, that in our work the more satisfactory the progress has been associated with a marked increase of cerebrospinal fluid eosinophils.

Naturally the tendency to hopeless chronicity commonly resulting in dementia precox focussed our serum therapy on this type of psychosis. It is possible that other fields of usefulness are fallow. Agitated depressions, the various forms of manic depressive disturbance, "idiopathic" epilepsy, the amentias, and most improbably the early paranoia types. Who shall say what may be the possibilities of benefit through this most direct means of biochemical attack? Extensive laboratory experiments on lower animals have demonstrated the harmlessness of aseptic meningitis of far more intense grade than that here recommended. Anaphylactic reactions occasionally may occur which will render tolerance tests a wise preliminary, though these reactions have responded promptly and favorably to hypodermic injections of one to one thousand adrenalin repeated every two or three hours if needed. Dangerous secondary inflammatory reactions will probably follow unwise subsequent serum injections when the spinal fluid remains overburdened with the toxic detritus of former treatments.

While theoretically the treatment is sound, I recognize how futile it all may prove. This list of cases is presumptuously small. But at the present time sixteen cases, unfortunately most of them of long standing and badly damaged, are under treatment at the Byberry division of the Philadelphia General Hospital, under the personal supervision of the medical director, Dr. Everett S. Barr. The reports of these and of cases now under treatment at Highland Hospital will be embodied in a subsequent paper.

Public institutions fairly groan under the increasing burden of morally and mentally moldering dementia precox patients—tens upon tens of thousands! If early diagnosis and prompt treatment as outlined in the first case can save twenty per cent., ten per cent., yes, even one in a hundred, our therapy will have advanced and the burden of human suffering be in so far lightened.

More efficiently stimulating agents in the production of cell repair, in the neutralization of cell damaging intoxications, will probably be found. Modifications in dosage and treatment-intervals will undoubtedly be more perfectly adjusted to the need of the individual case. But no one who has seen the apparently crushed and distorted mind rise and shake aside the mountain weight of disintegrating schizophrenic symptoms as though they were wraiths of vapor and come again, even for a day, into its mental own, can doubt for a moment the tremendous possibilities enfolded in this new method of therapy.

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Remarks on Myotonia Apropos of a Case of Paramyotonia, Limited to the Orbicularis Palpebrarum*

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Myotonia or tonic spasm of the muscles presents several varieties with regard to individual characteristics of the spasm, to its distribution and to the mode of onset. It may be congenital, such as the classical Thomsen's disease, it may be acquired (myotonia acquisita), it may be symptomatic in association with other diseases of the nervous system, such as for example paralysis agitans. It may be associated with progressive muscular atrophy (myotonia atrophica) or myasthenia gravis. The chief characteristics of myotonia congenita consist of muscular contraction and fixation upon an attempt to execute some movement. This contraction is more or less prolonged. The relaxation of the muscles is gradual. Once the muscles are relaxed the patient may accomplish his intended act, but any change in the character or in the rhythm of the intended movements, such as a sharp turn or increased speed, etc., may bring on a recurrence of the myotonic contraction. It is evident that voluntary muscular action is delayed.

In contrast with this, a reflex excitation of the same muscles will produce an abnormally increased response. Another characteristic feature of the disease is the mechanical and electrical excitabilities. A tap of the tendon is likely to produce persistent localized muscular swelling. The galvanic current produces prolonged sluggish contractions with either pole and, if the electrical application is prolonged or else a strong stabile galvanic current is maintained, tetanic contractions will be observed at the closure of the anode or of the cathode. Erb also observed under these circumstances wavelike muscular movements from the cathode to the anode. A strong faradic current produces undulatory contractions in the muscles. Another characteristic point of the affection under discussion is that repeated mechanical or electrical stimulation of the muscles decreases and finally exhausts the myotonic reaction. The last characteristic feature consists of a hypertrophy of the involved musculature and of its persistence.

As described above there are several varieties of myotonia. Among them there is one which presently deserves mention, viz, paramyotonia. It is a form of myotonia in which the symptoms deviate from the classical description, of which Thomsen's disease is the type. Like the latter it may be congenital, but like myotonia acquisita there may be a paramyotonia, acquired after birth. The characteristics of paramyotonia lies in two chief abnormalities, which justly or unjustly compelled Eulenberg, Delprat, v. Sölder, Senator, Martins, and Hansenmann to isolate it and separate it from the classical myotonia. They are: The muscular spasm is brought on not by voluntary movements (like in myotonia) but by exposure to cold and even to mild cold. The muscular tonicity lasts a long time, even hours. In Case II. of J. Rosette's series (1) the myotonic reaction of some of the affected muscles was evident only after chilling them. In the fifth case of the same author, the myotonic reaction was exaggerated in cold weather, but also by a general indisposition, coryza or by an oncoming menstrual flow. In some cases published under the title paramyotonia the classical myotonic reaction could not be obtained. These few examples merely prove that the classical myotonia may not always present all the typical symptoms in their entirety, that there may be encountered variations in the number and in the degree of intensity of the same manifestations, also that the symptoms may vary in different persons and that they may be different in the same person under different circumstances.

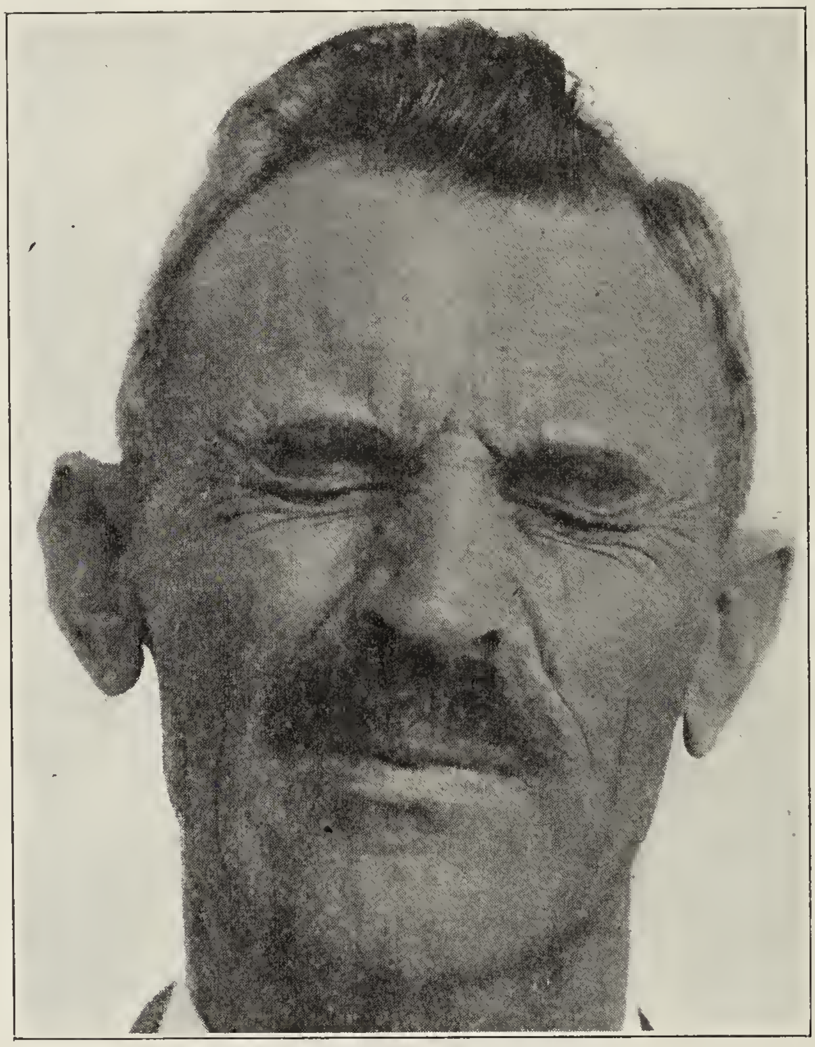
Fig. 1.—Patient during spasm.

In the following case deviations from the classical type will be observed in the original etiology, in the causative factors immediately preceding each attack, in the localization, in the duration, in the mode of relaxation of the affected muscles, finally in the electrical response. Whether the affection could be labeled myotonia acquisita or paramyotonia it is immaterial, but the outstanding feature is an intermittent tonic contraction of certain muscles. In view of the absence of the Erb's formula so characteristic of Thomsen's disease, and because of the absence of a muscular relaxation, the case would more properly belong to the category of paramyotonic group.

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*Read and the patient exhibited at a meeting of the Philadelphia Neurological Society, November 24, 1922.

Case—H. P., male, aged fifty-two years, painter for thirty-two years, after undergoing unusual mental stress and anxiety of a domestic character, developed several months previously a spasm of his eyelids consisting of a sudden involuntary closure. At first it occurred only exceptionally, but later more frequently. The spasm involved at first not only the eyelids but also the muscles of the forehead. To use his own expression, "they would all become extremely stiff." The attitude of the facial muscles during an attack reminds one of a condition when a burning or an acid substance or a vapor or gas suddenly irritates our conjunctivæ. There is at that time a strong wrinkling of all the muscles surrounding the base of the nose as if we wished to squeeze out the irritating substance from the eyes. This condition would last many minutes even as long as ten or fifteen at each attack. The so-called tightness of other muscles would leave him first, but the closure of the eyelids would remain much longer. No effort on his part would help to open the eyes: Raising his head, trying to look up from the angles of the orbits—would not in the least degree enable him to remedy the situation during the attack. The closure of the eyes is so firm and the orbicularis palpebrarum is so rigid that no effort on the part of another person would succeed in raising the eyelids. Gradually the patient learned how to shorten each attack. He observed that blowing his nose or else turning his head abruptly for the period of seeing the object of a sudden stimulation or a noise which happened to occur near him, such as a calling out loudly by another person, would enable him to open his eyes and then he would do it promptly without the least difficulty. As to immediate exciting causes of individual attacks, he was unable to give much information with the exception of a suddenly appearing artificial light, which would promptly bring on a spasm. The onset of each spasm is sudden and the termination is also brief, although not sudden.

Mechanical stimulation of the eyelids, such as percussion or a quick tap, produces a prompt contraction and a rapid relaxation of the muscles. The same rapidity of response and disappearance of it is observed also in all the muscles which originally participated in the spasm, namely in the musculature around the base of the nose, although presently the latter no more contract during the closure of the eyelids. When this mechanical reaction is compared with that of all other muscles of the face or of the body in general, the difference is striking in that the response in the involved muscles is decidedly quicker and more pronounced. Over any other part of the body the muscular reaction is normal. The electrical test with galvanism and faradism at no time gave a myotonic reaction: there was no wavelike contraction seen; there was no tetanic contraction at the anodal or cathodal closing and there was no anodal opening contracture. The faradic current did not produce undulatory contractions which are habitually observed in myotonia congenita. In this case both currents produced an unusually prompt response and a rapid relaxation of the muscles. This was particularly manifest when a comparison was made with similar manipulations of all the other muscles of the face.

Further examination revealed preservation of mobility and of all sensibilities in the affected area as well as over the rest of the body. The station and gait were normal. The patellar tendon reflexes were markedly exaggerated, but there was no other abnormal tendon or cutaneous reflex. Ataxia was absent in the upper or lower extremities. The sphincters were intact. The pupils reacted to light and accommodation. The eye grounds were intact. The eye muscles were normal. All other cranial nerves were not involved. The mental faculties were intact. There was no suspicion of a neurotic makeup.

The patient's previous history was entirely negative. He never used alcoholic beverages. He smoked moderately. Although he has been a painter for thirty-two years, he never showed symptoms of saturnine encephalopathy or physical signs of lead intoxication. The urine was free from lead. Whether the continuous mental anxiety and worry predisposed him to the present functional disorder it is difficult to say definitely.

Presently there was some improvement in his condition in that the myotonia is confined only to the muscles of the eyelids. He was placed on frequent doses of strychnine for a period of three weeks with the result that the spasm of the other muscles than of those of the eyelids had disappeared. Biological tests were all negative.

The case is interesting from several points of view: While it belongs to the group of myotonia, inasmuch as the muscular spasm is essentially tonic in character, the contractions are only intermittent, the onset is sudden, and mechanical irritability of the affected muscles is increased. Nevertheless it differs from the classical myotonia congenita in that Erb's myotonic reaction is absent, and that the muscular relaxation after an attack is rapid instead of being slow. Another point of interest lies in the localization of the affection. In cases of myotonia and of paramyotonia recorded in the literature at my disposal, the muscles of the eyes have been only exceptionally found involved, but always in association with other gross muscles of the body. In the present case apparently only the muscles surrounding the orbital cavities were affected, while the rest of the bodily musculature was totally free from spasms during many months of the disorder. The case is apparently unique from this viewpoint. It presents an example of an additional variety of myotonia. Although it differs from the other forms enumerated, above, nevertheless it belongs to the same great group. All varieties may differ in details as to the onset, mode of termination, exciting cause, mechanical reactions. The essential characteristic feature, however, namely the tonic spasmodic contraction intermittently occurring is invariably present in all forms of myotonia.

The pathogenesis of the affection is still obscure. In the congenital form, especially in cases associated with muscular atrophy, the conjecture may be that one deals here with an inherited abnormality of muscular structure or function, or as Rosette (*loc. cit.*) suggests, with an inherited factor which exerts an obnoxious influence on the neuromuscular system: in one series of cases this factor will produce myotonia with atrophy (2, 3, and 4), in other cases only myotonia and the musculature is spared; in still others myotonia with involvement of cerebral structures, such as in cases of neoplasms of the brain (5). While such a conception of myotonia is logically applicable to its congenital form, the acquired or temporary varieties which occur in middle age such as in the present case, may not readily find their explanation from it. Schiefferdecker has suggested a distinct disorder of the sarcoplasm and of the muscle fibrils. In this connection one may recall J. R. Hunt's view concerning the two systems of motility, namely; the kinetic and static. He also believes that the motor nerve endings are beneath the sarcoplasm and therefore in direct relation with the contractile content of the muscle fibre. The investigations of Dogiel, Huber, and Crevetin have shown the existence of nerve endings of a sensory character in relation to the muscle fibre which are situated outside the sarcolemma, on the outer side of the muscle fibre, in the tendon as well as in the intermuscular connective tissue. Such a conception of a kinesthetic component of muscle sensibility is applicable to the present case especially in view of a prolonged exposure to a mineral poison, such as lead, during a period of thirty-two years. It is possible that the mental state of the patient, coupled with sleepless nights (see above) and maintained during a period of many months, may have predisposed him to an attack of the lead poison and thus rendered him more susceptible to develop a neuromuscular disorder which illustrates Hunt's view that the kinesthetic system is the sensory component underlying "the twitch," the contractile tonus and reflexes of movement.

Another view on the pathogenesis of myotonia is that of Westphal (6) who considers the affection as a congenital anomaly of muscular tonicity. Seeligmüller believes that this is due to a congenital lesion of the motor tract. Finally another group of authors (Bernhardt, Strümpell, Ballet, and Marie, as well as Dejerine and Sottas) consider the disease a primary myopathy of congenital origin. Moebius (7) also admits this interpretation but believes that we are dealing with a systemic affection of the muscles depending upon the nervous system; in his judgment the disease belongs to the group of neuroses. Dejerine and Sottas (8) found histological changes in the muscles, namely hypertrophy of muscular fibres, also proliferation of the nuclei and formation of vacuoles in the hypertrophied fibres. Whichever of the pathogenetic explanations we adopt, in the present case the unsolved element will remain as such with regard to the exclusive localization of the disorder in the muscles of the orbit. Further investigations are necessary in that direction.

I wish to acknowledge my indebtedness to Dr. W. Swindells for the privilege of studying the case.

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Psychology as a Factor in the Practice of Medicine*

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The practice of medicine is pursued in three ways; many treat symptoms, many treat disease, and a few treat the patient as well as his symptoms and disease. It is the latter consideration which is within the scope of this paper. By the phrase treat the patient himself it is not intended to infer that his disease or symptoms can be slighted but that in addition it is essential to consider the patient as a person with powers of thinking, feeling, and acting and not simply as a spinal cord animal prone to a variety of pathological somatic states. In order to treat the patient as well as his disease it is essential to review a few fundamental principles of psychology.

"Much confusion has arisen in the language that deals with mental phenomena. In the first place the term psychology is often given, by implication, many mysterious and confusing meanings. Briefly, psychology is only a sort of physiology. It deals with human behavior, with the response of man, the wise animal, *homo sapiens,* to his environment. Just as physiology deals with the reactions of his separate organs and groups of organs to their extrinsic and intrinsic environment, so psychology deals with the response to environment of man as a whole" (1).

Personally, I am inclined to believe that it is the general neglect of psychology in medicine that is partially responsible for various cults, occult and otherwise, of a pseudomedical nature. It is because the patient does not get satisfaction from the medical practitioner, that in many cases determines his visit to the osteopath, chiropractor, or other tyro.

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*Read at the March, 1923, meeting of the Ramapo Clinical Society.

"Among the most frequent and most commonly misunderstood results of a poor adjustment of man to his environment is the condition we call nervousness. Nervousness is not a disease of the nerves or the brain or any other part of the body. It is not autointoxication. It is not weakness of the nerves or exhaustion or fatigue nor is it a perquisite of the idle rich" (1). Above all, it is not a disease but a symptom having its origin in a physical or mental maladjustment.

Every patient complaining of nervousness or vague ill defined complaints, aches, or pains deserves a most thorough examination, physical and mental. The chief point to bear in mind is that if an exhaustive study of the physical state discloses nothing pathological, it is a mistake to conclude there is nothing wrong with the patient. If the patient had nothing wrong with himself he would not have visited the doctor. A headache may be caused by a chronic toxemia, it may also be due to a mother in law. One is just as likely to have dyspepsia from a nagging wife or husband, as from a gastric ulcer. "Human behavior is a fact and in behaving the whole individual is involved with all his mechanisms and every organ is liable to be called to duty for the special reaction. One patient may have as an indication of emotional distress palpitation, another, asthma; one may vomit, another may faint. Even in cases where there is actual organic disease present the disability of the patient may be disproportionate to the organic involvement, the patient seems to refuse to get well although everything seems to favor recovery" (1). It is well then for the physician to search for the proverbial Ethiopian in the woodpile, to scrutinize the situation and to see whether there may not be a subtle gain from the invalidism. It may then be found that the sickness is a powerful weapon or a useful crutch.

To understand how such reactions come about we must realize that in our evolutionary process we have inherited certain patterns of mental reactions on which, in our primitive state, our very life and existence depended. With the complexities and restrictions of civilization these instinctive reactions must be constantly curbed and thwarted, naturally they are especially prone to be disposed to abnormal deviations. We have an excellent analogy to such a state on the anatomical side of our makeup in the case of the appendix. These mental reactions are instincts and emotions. For our purposes in this paper I shall mention only the instinct of self preservation consisting of flight and fight and its corresponding emotions of fear and rage. It is well to point out that in man this instinct or rather its emotions of fear and rage can be actuated by abstract thinking as well as by concrete situations. Thus once there has been a particularly distressing situation engendering fear or rage, the fear or rage may be tripped, as it were, at any time by thinking back to the situation itself or by encountering some other situation of a neutral sort, which happens to be mentally associated with the original episode. The occurrence of hysterical attacks in conjunction with an inconsequential situation aptly illustrates this point.

A second psychological principle is the wish to avoid or negate some unpleasant situation without the ignominy of being a slacker in both the eyes of the public and ourselves. This evasive process is frequently accomplished by using a physical complaint as an alibi or excuse.

A third psychological principle is an inherent deside for sympathy and attention, both of which may be promoted or appeased by having some physical complaint.

A fourth concept is the psychology of pain. Pain is a relative matter. What is pain to one individual may be only an unpleasant sensation to another. Common body and visceral sensations may amount to unpleasant feelings or actual pain in some persons. Pain is dependent upon the stimulation of the nerve end-organs and the interpretation of the sensations thus produced by the individual.

Fifth, it is a recognized psychological fact that the more attention that is given to anything the more important it becomes in the eyes of that person. Again, it is not an uncommon psychological trick that if we look hard enough for a thing and believe that it is there we are very apt to find it or think we have found it, which amounts to the same thing.

Last, it should be made clear that these few psychic reactions are present in all of us subject to individual variations. They may be present to a pathological extent without physical cause. They may be released, so to speak, by a lowering of the physical reserve as a result of disease, chronic infections, toxemias, and other conditions. Finally, once set in motion, they attain a certain momentum, and everyday that goes by in which they are fed and appeased, or in some way continue to be an asset from the patient's viewpoint, just so much nearer will the patient be to a professional invalidism and just so much more remote will be the patient's chance of recovery from his or her neurosis.

Let us see what are the facts which demonstrate that emotions and feelings can cause changes in organic physiological activity. In the first place we have the brain with its various associated centres, we have efferent and afferent nerves composing the white matter of the spinal cord, and we have the sympathetic and vagotonic nervous system supplying all smooth and cardiac muscle and glandular structures.

Beginning centrally there is some evidence pointing to an anatomical seat of the emotions. Witness the senseless laughter, crying, anger, and silly tenderness of the cerebral arteriosclerotic; also the lack of emotional tone in the Parkinsonian case, or even the period of excitement or laughter of ether anesthesia.

Cannon has demonstrated on dogs and cats that fear and rage produce changes in the gastric and salivary secretion, sugar metabolism, coagulation of the blood, the action of the musculature of the gastrointestinal, cardiovascular, and genitourinary systems through sympathetic nerve influences (2).

Practically what does this mean. How may the general practitioner utilize this material, in what form in other words, since it cannot be made into a pill or dissolved in a solution, can it be administered to his patients. To begin with one must familiarize himself with the six psychological principles as outlined above and bear in mind that emotional forces are capable of producing important functional organic changes.

Second, keep an open mind toward every patient that is nervous. Do not conclude that there is nothing wrong with him or her if no organic changes are found. Bear in mind that their complaints are real to them even though they might not be real to you. After a thorough survey of the physical side assure them there is nothing wrong organically and under no circumstance use the term imagination. This term is bound to foster resentment and antagonism and gets neither the patient nor the physician anywhere. Under such a condition encourage the patient not to be alarmed over his symptoms by showing him how they point to nothing serious, and tell him the less attention he gives to them, the greater the effort he makes to ignore them, the sooner they will disappear.

Third, scrupulously avoid arousing fear or apprehension in any patient.

Fourth, do not offer theoretical explanations for their symptoms, if you cannot find a definite organic pathology. Such explanations are taken and enlarged on by the patient and frequently do more harm than good.

Fifth, promote optimism and give plenty of encouragement not only to the nervous patient, but to every patient under your care.

Sixth, if his nervousness is serving as an alibi to avoid some unpleasant situation, or if it serves as a weapon or a crutch, secure for the patient a more rational point of view, encourage him to face situations as they are, and do what is possible to remedy or palliate the unpleasant situation itself.

Seventh, if there is an element of an unhealthy demand for sympathy and attention, a frank talk followed by judicious neglect from all who come in contact with the patient, is surprisingly beneficial. Remember, above all, that suggestion is a powerful influence either in producing and perpetuating a state of professional invalidism or in furthering and hastening recovery.

"There is a mental side to every illness and the patient is a thinking feeling being as well as a collection of tissues, organs, systems, juices, etc. The bodily and mental effect of such emotions as dread, courage, hope, despair, are neither negligible nor infrequent" (1).

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The Physiological Diagnostic Dream

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Amid the vast investigation concerning the wish-fulfillment dream and the dream based on the fear instinct, there remains a type of dream which has largely escaped notice and to which the subject matter of this paper will be strictly confined. This form of dream may, indeed, be filled with highly symbolical imagery. Doubtless the followers of Freud will find much in the dreams cited below. In this type of dream, to which the writer refers as the physiological diagnostic dream, if there is sex symbolism that is a secondary matter, an upheaval from the limbo of the subconscious permitted by a disturbed metabolism.

I believe that in this type of dream the beginning lesions are producing pain or sensation so slight that it remains unnoticed during the distractions of the day. In sleep its stimulus produces a dream whose content corresponds absolutely to the type of sensation and to the location of the physical trouble. The forms in the dream may possibly be determined by the libido, although I believe them to correspond as a rule to the fear of a thing whose painful effect would resemble the bodily stimulus as a burning pain producing a dream of fire. Psychoanalyzing these cases, however, seems useless, as the dreams disappear with the physical troubles.

A characteristic of these dreams seems to be that they are repeated, and in only one of the cases is there any variation of the images. In this case the variation corresponds with the increase of the local disease showing a consecutive approach and increase in intensity, constituting a definite warning.

Case I.—Mrs. B., thirty-eight years old, well nourished, of rather phlegmatic type. She "did not feel well" but could not say just why, except that she felt vaguely "nervous" and "for almost a year" had been troubled by a repeated dream. She seemed to see a woman who held a lighted candle toward her left leg. At first the woman did not burn her but, at the time she consulted me, the woman had come close and did seem to burn her. The woman was always the same, resembling a nurse but no one that she knew. The dream was now repeated "every three or four nights" for several weeks and she thought she needed psychoanalysis. On being asked if she had any pain, she said that of late she "had begun to have a little pain in the left shin."

There was not much pain on deep pressure but vibration of the heel produced sharp pain in the leg. I told her she had better have an x ray and consult a surgeon, that I thought there was inflammation about the bone. She was going to New York and did not follow advice. She apparently was displeased that I did not think the trouble was with her mind. I was later informed that there had developed an osteomyelitis of the left tibia and she had been operated upon.

Case II.—Mrs. H., a frail woman of twenty-six, three healthy children. Although physically weak, was very sensible, not at all hysterical, did her own housework although she was not fit to do it. She was not a complainer but very patient. She had for several years dreamed that she was being chased for a long distance by an unknown man and would awake breathing rapidly, trembling and with tachycardia but not frightened. "I would turn over and go to sleep again."

She had once, with some other girls, been chased by a drunkard "but we just ran around the corner and I never am afraid to go out at night." Association test showed a normal mind.

She was much underweight, reflexes somewhat exaggerated, had had an appendectomy and right ovariotomy three years before, had at time a fibrous left ovary and many adhesions which gave her much pain. A later operation for the adhesions showed a fibrous band from the appendix stump to a point in the iliac fossa. The band was the size of a little finger and dragged the cecum into the pelvis.

She had intermittently coarse irregular tremors which were not intention tremors but seemed to depend largely on fatigue and sometimes caused her to drop what she was carrying. She had had these since fifteen or sixteen years of age, also sudden feeling of weakness and fainting spells, which were real and not hysterical, although she had been so called by two physicians. Tachycardias would come on without warning, usually with the tremor, and last for an hour or so, the heart would run from 90 to 100 and with irregular rhythm. Her blood pressure was variable, never over 106 and often dropping suddenly to 80 or 90 systolic. This patient being in my house, I could watch her closely. These low pressures would last for a few hours and suddenly cease. She told me the muscles of her arms felt stiff when the tremor was bad and that her wrists would feel as if a string were tied around them. Every time she said that, the pressure registered below 90 systolic.

Believing her to be deficient in parathyroid I put her on one-tenth grain three times a day. By the end of the third week the tremor and tachycardia had disappeared and with them the dream which for some weeks had been of almost nightly occurrence. As the pressure did not rise over 110, adrenal and ovarian extracts were added with decided improvement in the average pressure and the fainting. She stayed on glandular therapy for a year, during which the dream did not recur. Stopping glandular therapy for a few months, both physical symptoms and dream recurred and again disappeared under glandular therapy.

Two years later she again had fainting but this was from weakness and pain, from adhesions and the left ovary, and she died following an operation after I had left Washington.

In this case the tachycardia, tremor, dyspnea all corresponded to the physical condition following fright and flight and the dream was the subconscious justification and selfexplanation of the bodily sensation.

CASE III.—A negro, aged forty, came into the medical clinic at Freedman's Hospital, complaining that he was continually dreaming about a rat. The intern referred him to the neurological clinic. The man was underweight. He did not appear nervous. He complained that he was troubled because he kept dreaming about a rat which gnawed him over the right hypogastrium. It never seemed to come from anywhere in particular or do anything else. "It was just here, a-gnawing, and then I wake up."

Questioning elicited the following history: Three years previously he had an attack termed by his physician "acute indigestion, followed by sour stomach." Not doing as well as he thought he should under medical treatment, and reading some article in a health magazine, he stopped treatment and followed the dietary rules of the article mentioned. He drank a cup of hot water and a quart of hot milk in the morning, drank about a quart of water during the day and about 6:30 ate a dinner of meat (no pork) or fish, potatoes and green vegetables and whole wheat bread and a light dessert. No tea, coffee, alcohol, cocoa or tobacco. He retired about eight as he rose early. About nine or ten he often awoke, dreaming the rat was gnawing him. At first he denied having pain, but, on being asked if he was sure of that, admitted that he sometimes had a gnawing pain under his right shoulder when he woke from a dream.

Deep pressure over the right hypogastrium elicited tenderness. I referred him for x ray and gastroanalysis instead of psychoanalysis, with provisional diagnosis of pyloric ulcer. He proved to have a duodenal ulcer and was successfully operated upon. After the operation the dream disappeared and two years later the man was in good health and the dream had not recurred. Here the form of the dream was distinctly suggested by the man's own characterization of the pain and his dislike of rats, which was marked.

CASE IV.—This case was related to me by the patient's sister, a very intelligent teacher trained in psychology. Miss X for about two weeks had applied herself constantly to some fine embroidery by day and late at night. At the end of this time she had no pain in her eyes, but was rather fatigued. She dreamed on three successive nights as follows:

1. *She watched a multicolored, wavy aurora borealis.*

2. *She was sewing on a dress made of bright, wavy, manycolored ribbons.* (Note the lesser distance of the object dreamed of and the resemblance of the ribbons to the aurora. Also the intenser color, which was described as "dazzling.")

3. *There were "wiggly, incandescent worms of all colors" crawling over her eyelids, she could both see and feel them.* (Note closer approach and still intenser color plus feeling.)

On the fourth day she complained of slight pain in the eyes, the next day the pain was intense with flashes of light. She went to an oculist whose name the sister did not remember and was treated for retinitis. The correlation between the stimulation of the rods and cones by the capillary congestion and the visual content of the dream is obvious. This dream content apparently has no fear basis on the first two nights but may well have one on the third.

It is probable that dreams of this type will far oftener come to the notice of the general practitioner or surgeon than to that of the neuropsychiatrist and the writer would be very glad to hear of such cases. This paper is not offered as a complete exposition of the subject but in the hope of calling attention to this type of case and securing the cooperation of others in working out the field. It is not probable that a large number of cases will come into the experience of any one man, even with a hospital service. In selecting such cases the single dream should be disregarded as possibly incidental and only the dream of several repetitions with unvarying content reported.

360 COMMONWEALTH AVENUE.

A Case of Optic Atrophy in Multiple Sclerosis*

Review of Theories on Etiology and Its Influence on Treatment

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Multiple sclerosis has been considered to be a disease of rare occurrence. Starr (1) quotes Jelliffe's figures of 109 cases out of 31,502 clinic patients. Mettler (2) quoting Spiller, states that it is one of the rarest diseases which we meet. Among the insane it is seen still less frequent than among the general population. Out of 19,500 admissions, Lowrey (3) only found five cases.

Primary optic atrophy in multiple sclerosis is a rare sign in this seemingly rare disease. Oppenheim (4) states that it is exceedingly rare. Foster Kennedy (5) in 1914 reported a case of multiple sclerosis in which double optic atrophy following a retrobulbar neuritis was present. He does not believe, however, that bilateral blindness can be attributed to multiple sclerosis. Crossby (6) reported a case in which both temporal halves of the disc were very pale while the nasal halves were paler than normal. He adds the further statement that atrophy of the optic nerve is seldom ever complete. Klingmann (7) records the fact that Uhthoff and others have demonstrated that the optic nerves are affected more frequently in multiple sclerosis than in tabes dorsalis; in fact, more often than in any other disease of the nervous system except cerebral tumor. He mentions one case of double optic atrophy where vision still persisted to the extent of 20/100 in the left eye and 20/200 in the right one. According to this author three per cent. of multiple sclerosis cases show a marked atrophy. He fails, however, to state whether it is complete or not. Parker (8) made the observation that papillary and retrobulbar neuritis are not unusual but that choked disc was a rare finding.

Because of a number of unusual features that this case possesses, I thought it justifiable to place it on record.

Case.—The patient, Mrs. M. W., of Bayonne, N. J., aged twenty years, American, history number 13772, came to the New York Post Graduate Medical School and Hospital in October, 1920. Her chief complaint was inability to see out of the right eye. It was not until April 15, 1921, that I first saw the case when the following history was elicited.

The onset of her illness dates back to the middle of November, 1919, when pushing a baby carriage on the street she noticed that she suddenly began to pull the carriage to the right side and become very dizzy. Her mother and sister attempted to support her but she dragged them also to the right. She then leaned against a post, felt dizzy, weak and imagined that the post was falling toward the right. In addition she felt as if something was pushing her to the right. There was no nausea, nor did she vomit. The dizziness was severe and increased upon raising her head. Her body was covered with cold perspiration. In twenty to thirty minutes she was able to start for home but with a tendency to stagger toward the right more than to the left. No eye symptoms were noticed at that time. During the remainder of the evening she sat quietly but was dizzy. The following morning she awoke apparently normal. While combing her hair she suddenly was attacked by severe vertigo, and fell across the foot of the bed. "The right eye began to jump up and down." She soon sat up but had vertigo. Everything about her, the furniture, walls, ceiling and floor seemed to rise and whirl about in circles. On attempting to walk she soon found that right sided support was necessary. A local physician called at the time diagnosed the case as one of "inward hemorrhage." The sight of the right eye was lost completely that morning. The next day the attending physician said she had had a stroke. She was able, however, to use both upper and lower extremities; no paralysis was present. The knee jerks tested at that time were normal. For the next two weeks she remained in bed and received medicine. A severe frontal headache then developed. Another physician called in to see her at the end of two weeks diagnosed the case as a "stroke and found a blood clot in the back of the eye." (Fundus examination.) The blood pressure was said to have been high. Two more weeks were spent in bed (one month in all) before she was able to get about on her feet. The dizziness had greatly disappeared but the frontal headaches still persisted.

At the Manhattan Ear, Eye, Nose, and Throat Hospital she was told that the right eye had been seriously involved. At that time nothing was distinguishable with the afflicted eye but at present she is able at times to detect light.

For the past few weeks she has been very dizzy in the mornings immediately after rising. This condition persists for three hours before she is relieved.

She had had measles and mumps at eight; pertussis at seventeen and twenty years. At thirteen (1914) a bed fell on her. She was unconscious for two days and did not recognize anyone. She complained of severe headache. Recovery was complete in one week. At sixteen (1917) she had an appendectomy. At nineteen (January, 1920) had left oophorectomy for ovarian cyst. Since her operation she has vomited often but irregularly and it was not associated with dizziness. Menstruation started at eleven, was irregular, flowing every week for three to four days, having only a period of freedom for two to three days. She became anemic as a result of this metrorrhagia. Her periods gradually lengthened until she menstruated every two to three weeks. Dysmenorrhea was absent until the age of fourteen years and has been present since. Regularity was established after the oophorectomy and is of the twenty-six to twenty-eight day type. The flow is profuse and lasts seven days.

She was married at nineteen. Dyspareunia was present for the first three months and she was frigid. After ovariectomy, above complaints were dissipated and both libido and potency became normal. There was one miscarriage at two months. No children.

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*From the Neurological Service of Dr. F. Tilney, New York Post Graduate Medical School and Hospital

She drank coffee and tea, alcoholic liquors were not taken at all. Appetite was good. Sleep was restless. Thirst was excessive. Bowels were constipated. She had frequency, urgency and nocturia twice a night.

NEUROLOGICAL EXAMINATION (APRIL 15, 1921).

Voluntary motor system.—There were no abnormal attitudes or deformities. On toes, heels backwards, sidewise, running, the gait was normal. On attempting to walk a straight line she fell to the right. Fournier's tests were normal. Associated movements of trunk, arms and head. Right arm held quiet during walking.

Coordination.—Equilibratory, standing with feet together, eyes open—fell invariably to right. Romberg fell to right as above. Standing on one foot left and right—was unable to stand on right or left foot without falling. Right ankle and left knee gave way. Nonequilibratory—finger to nose and eyes open—normal; eyes closed—past pointed slightly with both left and right hands. Finger to finger, eyes closed—past pointed slightly. Toe to object above recumbent patient eyes open and closed, left and right normal. Heel to knee and along shin, eyes open and closed left and right normal. Adiadochokinesis was absent; dysmetria absent; skilled movements normal; handwriting perfect; conversation normal; speech test phrase (third riding artillery brigade) normal. There were abnormal, involuntary movements—irregular, rapid, coarse tremor of right hand and arm. At times it disappeared completely. Exaggerated when excited. Chiefly present at rest.

Reflexes—

Deep	Left.	Right.
Biceps	2	2
Triceps	2	2
Suprapatella	0	0
Patella	2	2+
Achilles	2	2+
Ankle Clonus	0	0
Superficial—		
Supraumbilical	2	2
Suprapubic	2	2
Upper lateral abdominal	2	2
Lower " "	1	2
Babinski	0q	0
Chaddock	0	0
Oppenheim	0	0
Gordon	0	0
Schaffer	0	0

Muscle strength was normal. There were no atrophies nor hypertrophies. Abnormal associated movements were present. The pronator sign of Strumfell was absent. Hoffmann's sign was doubtful on the right, absent on the left.

General sensory.—Touch acuity, touch localization, vibratory localization, muscle tendon localization, stereognosis localization, and barognosis localization were all normal.

Cranial nerves.—Optic nerve—January 4, 1921—Dr. Stevens reported the following—temporal border of left disc showed indications of atrophic changes in a narrow ridge. No note on right disc. Optic atrophy of entire right disc was seen. Oculomotor, trochlear and abducens—pupils equal, round, central regular, react to light and accommodation, consensual and left convergence abnormal. Right eye fails to converge. No nystagmus. Trigeminal was normal. Facial—left upper third facial paralysis. Auditory—tests were carried out by Dr. Clarence Smith. Vestibular apparatus—caloric irrigations in both ears with head in various positions showed a past pointing of three to six inches toward the right with both left and right hands, regardless of the ear irrigated. There was no nystagmus. Cochlear division—the Rinne test was positive. The glossopharyngeal, vagus, spinal accessory and hypoglossal nerves were normal.

General physical examination.—Glandular status —anterior cervical nodes palpable, posterior cervicals on right palpable, inguinals palpable; exillaries and epitrochlears not felt. In the nose there was a beginning atrophic rhinitis. The throat showed diseased tonsils. The heart and lungs were normal. The abdomen showed two operative scars, otherwise it was negative. There was frequency, urgency and nocturia. The pulse was 108 regular, small, blood pressure 130 m.m. systolic, 80 m.m. diastolic, pulse pressure 50.

Serology and laboratory tests.—The first blood Wassermann was reported doubtful, the second and third negative. The spinal fluid including the Wassermann was negative.

A urinalysis of day specimen showed a faint trace of albumin, few pus and epithelial cells: of night specimen—faint trace of albumen, few epithelial cells.

X ray examination of accessory nasal sinuses, November 24, 1920, showed slight diminution in illumination of the left maxillary antrum. The appearance was such as might be produced by hypervascularization or slight infiltration of the membranes. There was no evidence of exudate. The right sphenoid was also slightly veiled (report by Dr. William H. Meyer).

In order to further study the case more thoroughly the patient was admitted to our service on May 20, 1921. The positive findings on May 21, 1921, were as follows: Abnormal attitudes and deformities—on walking the head was kept toward the right. On walking a straight line the patient fell to the right. Fourniers's test was done very well except on returning fell to right. Associated movements of right upper extremity were lost. With both feet together, standing up straight, eyes open, she swayed to the right. Romberg fell to the right. Standing on one foot, left and right—right foot unable to bear weight; the left was normal. Nonequilibratory.

Finger to nose, the right hand was slightly ataxic; left hand uncertain. Finger to finger overreaching. Each finger to thumb was normal. Past pointed to right with right hand. Toe to object above recumbent patient—fair. Heel and knee was normal. There was a little adiadochokinesis in the right hand as well as dysmetria.

There was a rapid, rhythmical, fine tremor of right arm and hand present at rest which tended to disappear on skilled acts.

Reflexes— Deep.	*Left.*	*Right.*
Pectoral	1	1
Biceps	2	2
Triceps	2	2
Suprapatella	2	1
Patella	2	3
Achilles	2-4	3-4
Superficial—		
Supraumbilical	2	2
Suprapubic	2	2
Upper lateral abdominal	3	3
Lower “ “	2	2
Babinski	0	0
Chaddock	0	0
Oppenheim	0	0
Schaffer	0	0
Gordon	0	0

There was a definite weakness of the right upper and lower extremities. The general sensations were normal. There was right optic atrophy, left temporal disc showed faint pallor at the extreme border. The right eye failed to converge. The position of the eyes was normal. There was no nystagmus.

Acoustic nerve tested by Dr. Clarence H. Smith. His report was as follows: "Functional examination of the auditory apparatus made May 24 and 26, 1921, showed the following results. The cochlea on each side was unimpaired, hearing being intact. The horizontal semicircular canals though impaired slightly, were still functioning. Therefore, the labyrinths and medulla were uninvolved and we were dealing with a central lesion or central lesions. Stimulation of the vertical semicircular canals by a prolonged caloric test on each side gave regular results of absence of nystagmus, vertigo or past pointing. This would point to a lesion in the upper half of the pons. There was persistent past pointing of the right arm to the right spontaneously. A test which should bring the right arm to past point to the left did not do so. This symptom pointed to a lesion involving the inward pointing centre of the right arm in the cerebellar cortex. She had also other symptoms pointing to a cerebellar lesion, adiadochokinesis, showing the right wrist to be impaired as compared to the left, inaccuracy in the finger to nose test and falling to the right in the Romberg test. I know of no single lesion which would give such a diversified picture, a lesion in the pons and one in the cerebellum, so one must think of a disseminated condition such as one would find in multiple sclerosis."

There was paresis of the upper left face. The temperature ranged from 97.8° to 99.4°, the pulse from 80 to 112, the respirations from 20 to 28.

Serology and laboratory tests.—The blood chemistry on May 23, 1921, showed urea nitrogen 13.9 mgms. per 100 c. c. of blood, sugar 0.094 mgms., and chlorides as sodium chloride 0.494 mgms. The blood count done on May 21, 1921, was reported as 8,000 white blood corpuscles, of which 68 per cent. were polymorphonuclears and 32 per cent. lymphocytes, 6 per cent. large and 26 per cent. small; hemoglobin 80 per cent. Blood Wassermann was negative. The blood culture on May 31, 1921, for spirochetes and other organisms was negative. The spinal fluid on May 31, 1921, was not under pressure and clear. The dark field examination and culture for spirochetes yielded negative findings. The spinal fluid Wassermann, the colloidal gold, Levinson test, globulin and cell count were all negative. The spinal fluid injected intraperitoneally into a rabbit failed to produce any paralysis in three weeks. Urinalysis gave faint traces of albumen and epithelial cells.

DISCUSSION AND DIAGNOSIS.

The case presented many unusual and interesting features from several angles. The ancient and famous triad of Charcot, namely, scanning speech, nystagmus and the socalled intention tremor, was absent. Neurologists of today do not wait for the development of these symptoms to diagnose multiple sclerosis. The speech in our patient was beginning to be slow though not scanning. Vesical symptoms in the form of incontinence or retention were lacking. The presence in this case of abdominal reflexes almost militated against the diagnosis of multiple sclerosis. Optic atrophy in both nasal and temporal halves of the right disc is most unusual. The strokes which the patient was supposed to have had may be interpreted as transient apoplectiform seizures. These attacks are uncommon and because of the rapid recovery from them may at first mislead the examiner to make a diagnosis of hysteria. The variability of the neurological signs at different examinations, though often present, together with cerebellar findings of past pointing, some ataxia, adiadochokinesis and Romberg all go to make up a bizarre picture.

To localize to one focus a condition so protean in its symptomatology and pathology, we were unable to do. Thus, in spite of the presence of rare and the absence of common signs, a diagnosis of multiple sclerosis was made.

ETIOLOGY.

Multiple sclerosis up to recently had been considered a disease of the nervous system with various hypothetical theories for its etiology. The new impetus given to the experimental side of the disease compels me to say a few words of the encouraging work done so far.

The older etiologies now growing obsolete, in view of the present discoveries, were given as various infections, metallic poisons, trauma, exposure, violent emotions and Strumpell's advocacy of a congenital tendency to proliferation of the glial tissue. These are the causes given to most of the neurological conditions where the true cause is as yet unknown.

In reviewing the literature on this subject we find that Bullock (9) made the first great advance. From a typical case of multiple sclerosis he drew off the spinal fluid and injected it into the rabbits and cats. Four or five of the animals developed paralysis. Simon (10) also produced the same results in rabbits. This author ran control experiments with spinal fluids of normal individuals and with positive Wassermann fluid. These controls all gave negative results.

Kuhn and Steiner (11) staining films of blood drawn from the still living paralytic animals and from the heart of the dead guineapigs and rabbits with Giemsa's stain and Loeffler's stain for cilia of bacteria reported seeing spirochetes by dark field examination. These spirochetes were different from those of Spirochæta pallida and resembled mostly the spirochete of Weil's disease yet differing from the latter in being relatively straighter and more regular.

By dark field they are very actively motile and provided at one end with a more refracting knob. In successful preparations one end appears to continue in a celium. Further observations on four cases were made, three were quite fresh, while in the fourth the disease had lasted for two years, but showed signs of recent exacerbation. With the blood and serum of these cases rabbits and guineapigs were inoculated. These animals developed a fatal disease which could be transferred to other animals by injection. By Levaditi's silver method, after preliminary fixation of the blocks in alcohol and impregnation with three per cent. silver nitrate, spirochetes were found always lying in the interior of the bloodvessels and capillaries of the liver of two guineapigs and three rabbits. Spirochetes were never found in the tissues of the animals nor were they ever found in the human organs by these authors. They (12) later confirmed their own experiments by further new successful animal inoculations in which the spirochete was found. They do not as yet definitely attribute the etiology of human multiple sclerosis to that spirochete, as it does not at present fulfill all the qualifications of Koch.

In one of their experiments a monkey was inoculated intraperitoneally in March, 1917. Temporary signs of paralysis in the legs were first noticed in February, 1918. In June, 1918, the paralysis returned permanently and in July, 1918, when he was killed, the brain showed macroscopically circumscript gray spots in the white matter. The microscopic pictures were identical with those found in human multiple sclerosis. Spirochetes were not recovered from the monkey.

Siemerling (13) made the most important advance of all. He found by dark field examination living spirochetes in two sections from the brain of a man who died of multiple sclerosis. Thus was the work of Kuhn and Steiner confirmed. Schuster (14) also demonstrated fine spirochetes below the cortex in sections of the brain of a case of multiple sclerosis. Marinesco (15) injected six guineapigs by the intracerebral method with three c. c. of serum from two cases. By dark field examination of the cerebrospinal fluid taken from the fourth ventricle he was able to demonstrate large numbers of living and motile spirochetes. These animals showed paralysis before death. Hoffman (16) suggests that multiple sclerosis like neurosyphilis may be the secondary result of a previous spirochetal infection of varying duration.

In our case, we were unable to produce any paralysis in the injected rabbit. The spinal fluid was injected intraperitoneally into a rabbit. No changes were noted in three weeks and the experiment was considered a failure. The failure in one experiment especially from an atypical case should not be used to condemn the findings of reliable workers. The only thing we can state at present is that we were unable to confirm the work of others. We hope, however, to continue our studies and shall make further reports on a larger series.

RECENT SEROLOGICAL STUDIES.

It is a well known scientific fact that a general paretic colloidal gold curve has been obtained in general paresis, plumbism, tuberculous meningitis, brain tumor and multiple sclerosis. It is, however, only in general paresis and multiple sclerosis that the colloidal gold reaction has been present in any degree of regularity. In the other three conditions it is merely incidental.

Moore (17), working on twenty-eight cases diagnosed as multiple sclerosis, twenty of which were definite and eight doubtful, found a pleocytosis in sixteen cases. He considered anything over five cells as abnormal. Globulin was present in twenty-five cases, excessive in ten. The spinal fluid and blood Wassermanns were negative in all cases. In eighteen cases the colloidal gold curve was of the paretic type, luetic in three and negative in seven. Thus, out of twenty certain cases of multiple sclerosis, a general paretic gold curve together with a positive globulin reaction appeared in eighteen cases, or ninety per cent.

The percentage is sufficiently high to warrant its use in diagnosis. Thus excluding the rare cases of plumbism, tuberculous meningitis and brain tumor that give the reaction also, a general paretic curve is indicative of either neurosyphilis or multiple sclerosis. The negative blood and spinal fluid Wassermann serves to differentiate between the remaining two conditions, except in long treated cases of lues where the Wassermann has become negative before the colloidal gold curve.

Adams (18) reporting preliminary results to the Medical Research Council on experimental investigation into the etiology of multiple sclerosis, states the following. All but two out of the forty-one cases examined gave either a paretic or luetic gold curve. Five showed a paretic curve, the remainder a luetic. The average number of cells was five small lymphocytes. Centrifuged specimens showed in two doubtful cases actively metile spirochetes. Attempts made to stain them failed. The protein content was present in seven cases. The Wassermann reaction was positive in nine cases, four both in spinal fluid and blood, two positive in the spinal fluid and negative in the blood, two positive in the blood and negative in the spinal fluid, one positive in spinal fluid but the blood was not examined. This simply means that lues may be coexistent rather than the cause of multiple sclerosis. Though the type of lesion is different in the two diseases, yet the selective site of the virus is the same.

TREATMENT.

Adams (18) reports the results of twenty-two cases treated with intravenous novarsenobilin, biniodide of mercury by mouth and intramine intramuscularly. Thirteen out of the twenty-two cases improved noticeably and nine have not been benefited.

Perdran and Stebbing (19) treated bedridden cases with salvarsan intravenously and metallic mercury intramuscularly. The sphincteric control was regained and the paraplegia disappeared, leaving a slight paresis of the legs. Relief was had for two years, when recurrence with symptoms simulating general paresis were had. The patient died and autopsy revealed typical soft pink patches of sclerosis in the spinal cord, medulla and white matter of the brain.

German authors have preferred the use of silver salvarsan, using it intravenously alone without the additional metallic mercury. The results claimed by them are remarkable.

SUMMARY.

Should the spirochete eventually prove to be the cause of the disease, we may then hope for the same results in multiple sclerosis that we are today enjoying in syphilis. Like lues early cases will give us the best results.

Salvarsan having a selective action on spirochetes will, in all probability, be the accepted drug. The form of salvarsan, whether it be the silver or the neo preparation, is yet to be determined.

We at the Post Graduate Hospital shall continue our study of the subject and hope to report more fully on a large number of cases in the future.

I wish to take the opportunity to thank Dr. Tilney and Dr. Osnato for permission to report this unusual case.

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Atypical Amyotrophic Lateral Sclerosis

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The classical type of this disease is familiar to most practitioners of medicine. There usually are pyramidal tract signs in combination with fibrillation and atrophic wasting of the muscles of the shoulder girdle and of the intrinsic muscles of the hand. Bulbar phenomena constitute an essential and usually terminal feature of the disease.

I have recently had under our observation, cases belonging in this group but deviating in their clinical course from the type commonly described. To my mind, they illustrate the fundamental pathology of the disease, with a mode of onset which, while similar in nature, yet differs in anatomical localization.

Case I.—Charles T., aged fifty-one, painter until one year ago, married, born in Germany, admitted to the service of Dr. Foster Kennedy, at Bellevue Hospital on February 18, 1921.

His chief complaint was weakness of the arms, and inability to walk. One daughter was mentally retarded and subject to fits of unconsciousness with paralysis of one side and impaired memory.

The patient had socalled rheumatism ten years ago; relieved by baking. He suffered from a temporary wrist drop ten years ago. Eight years ago he was treated for painter's colic at the Roosevelt Hospital. The limbs were not involved at that time. He also complained of impaired vision. He had influenza in 1920. Later the patient experienced an attack of colicky pain with profuse perspiration which was diagnosed as lead colic. He admitted a Neisserian infection, he took alcohol moderately and smoked little. He had had recurring attacks of bronchitis (socalled weak chest).

The present illness began a year ago with cramps and pain, in the left leg below the knee, increasing in severity and rapidly involving also the right leg. He gave up work eight months ago. Twelve months ago he experienced numbness in the hands but no weakness. While a lumbar puncture was being done, he felt a pain radiating down to his toes and a feeling of icy coldness which he could not get rid of for several days. He maintains that the left great toe seemed to get weak from the time of the puncture onward. He had not been able to extend it since. Both feet felt cold and have become wasted. The calves and thighs also had become atrophic. Ever since the onset, he was troubled by involuntary jerkings of the legs and arms and a feeling as if they were asleep. He had found increasing difficulty in walking, particularly in lifting his legs to go upstairs; he often fell and found it impossible to get up. He says he fell because he tripped over his toes. There were no bladder symptoms; blue line was never demonstrable.

The patient was mentally alert and cooperated well in the examination. Smell was normal. Right eye was damaged by an accident at the age of seventeen and since then he could read only with the aid of glasses. He believed that his eye sight had been impaired since the attack of lead colic. The pupils were normal. Ocular muscles showed no abnormalities. Motor and sensory fifth were normal. Patient had an old deafness of the right ear with impairment of air conduction. Uvula deviated to the left, on voluntary innervation. Patient had great difficulty in coughing but no choking spells. His tongue protruded straight, was not atrophic and showed no fibrillation. There was marked weakness of the quadriceps and anterior tibial groups. He showed double foot drop, bilaterally impaired dorsiflexion of the ankles with wasting of the extremities, especially below the knee (more marked on the right) fibrillation and involuntary jerkings. Previously he could lift a weight of fifty pounds by his feet; on examination he could perform no movements against resistance. All the toes could be flexed except the great toes. The foot could be everted but there was no extension of the toes or the ankle joints. The muscles of the calf and thigh were flabby. There was difficulty in flexing leg on the thigh. Gait was shuffling. His feet were raised with much effort to avoid trailing his toes on the ground. The patient had difficulty in balancing when standing still but there was no true Romberg phenomenon. The upper extremities showed fibrillation in the hands and shoulder girdle but no atrophy or weakness. On the sensory side, the patient experiences acute attacks of gnawing pain in the calves and lumbar region, with spasmodic tightening of all the muscles of the foot and leg. No marked objective sensory changes were found in the limbs, although there was dulling of all forms of sensation; over the feet possibly due to acrocyanosis. Sensation over the body was normal except for an indefinite level behind and front, extending to the clavicle, above which pinprick was more definitely felt. Patient complained of paresthesias in the hands. No spinal tenderness. Abdominals were not obtained. Knee jerks were present and equal, ankle jerks active with ankle clonus on the left. Plantars could not be studied on account of toe drop. Fibrillation was also found in the calf and thigh muscles. There was also a distinct reaction of degeneration in the extensors of the lower leg, calf muscles and flexors of the knee. Partial reaction of degeneration in the extensors of the toes was more marked on the left. A similar change was found in the quadriceps group more definite on the right. No bladder symptoms. After some time in the hospital edema of the legs developed. Blood chemistry was normal. Patient showed a marked emphysema and moderate atherosclerosis. Blood pressure was 154/90. Electrocardiogram indicated a poor myocardium, slight left ventricular preponderance, no block.

The patient was then transferred to the Montefiore Hospital (September 27, 1921). He could not stand or walk unsupported. The deep reflexes were active, abdominals and cremasterics were absent, double foot drop persisted and there was almost complete loss of power in the lower extremities, with marked atrophy of all the muscles, especially those of the thigh. Rossolimo and Mendel-Bechterew signs were positive on the left. Paralysis of the extensor longus hallucis eliminated the Babinski. Later on there developed some weakness of the left face with widening of the left palpebral fissure. There was a coarse tremor of the face, lips and tongue with slight fibrillation of the tongue. Patient began to experience difficulty in swallowing solids. There was weakness of both sternomastoids and atrophy of the deltoid and biceps with fibrillation both in the muscles of the shoulder girdle and in the intrinsic muscles of the hand. He gradually lost power in the left hand. At times difficulty in breathing developed. He died April 9, 1922 with typical bulbar manifestations. Mentality was clear to the end. Urine was negative except for a faint trace of albumin; no lead was found. Blood count: Red blood cells, 3,400,000; hemoglobin, 65 per cent.; White blood cells, 3,400; polynuclears 66 per cent.; lymphocytes 30 per cent.; eosinophiles 2; basophiles 1; monocytes 11. Blood Wassermann was negative. Blood pressure 170/120. Cerebrospinal fluid showed no abnormalities.

On autopsy the brain alone was examined, weight 1300 gr. There was edema with slight opacity of the pia over the parietal and frontal regions; vessels at the base, normal. The medulla was smaller than normal. On section there was injection of capillaries throughout and a globular enlargement of the choroid plexus on both sides at about the junction of the lateral and inferior surface. The entire plexus was extremely congested. The cord was not obtained.

Case II.—No. 208,429. Regina H., aged fifty-five, born in Hungary, married, housewife. Admitted March 5, 1921 to the service of Dr. B. Sachs at Mt. Sinai Hospital, discharged May 31, 1921.

The chief complaint was paralysis of the right leg for six months. The family history was negative. The patient had never been pregnant. Menses began at fifteen and were regular. Menopause came on five years ago. Patient was always in good health except that she had had a chronic nonproductive winter cough for years. She experienced occasional dyspnea, tachycardia and palpitation on exertion.

The onset of her present illness was gradual six months ago, when the patient noticed that the right ankle turned easily. She would fall at times. The right leg became progressively weaker until she was unable to stand. She was in bed or chair for two months. Lately she had noticed weakness in the other foot, leg and lumbar muscles. The patient could not sit up unaided, had no pain, paresthesias or sensory changes. The right leg had gotten thinner and weaker so that she was able to move only the toes. There was some tenderness along the posterior aspect of the thigh. Patient thought her arms were also thinner. There were no bladder or rectal symptoms. She experienced vague pains in the abdomen on attempting to sit up. "Blood test" some time ago was negative. She was treated for visceroptosis. Her condition has gotten slowly but progressively worse.

She was mentally clear. The right pupil was larger than the left, both a bit irregular and sluggish to light; slight ptosis of the left upper lid was present. Other cranial nerves showed no gross abnormalities. The heart was enlarged to the left; there was some accentuation of the aortic second sound. Patient's breathing is chiefly abdominal. There was paralysis of both lower extremities especially the right, except for movement of the toes and slight dorsiflexion of the feet. There was also some paresis of both upper extremities and the muscles of the lower back seemed weak. Wasting and hypotonia of the muscles of the back was noted. Abdominal reflexes were absent. The right knee jerk was absent, the left, feeble; right ankle jerk was absent and the left, feeble. There was a questionable left Babinski; no sensory changes were observed. There was distinct wasting of the quadriceps, anterior tibial and posterior tibial groups and of the gluteals.

Fibrillation was present. The spinal fluid was clear, under normal pressure and showed no cells. Fundi showed slight pigmentary changes, more marked in the right eye but they were otherwise negative. On account of the irregular and sluggish pupils, the patient was treated antiluetically for a time without apparent benefit. The patient had vague sensory changes from D 11 to L 3 on the right and some local tenderness over the lower dorsal spine. With the galvanic current there was slow contraction in the tibialis anticus, quadriceps and hamstring groups. KCC however, was greater than ACC. There was diminished faradic response in the peroneal and gastrocnemius group. Soon afterward, there was noted wasting of the intrinsic muscles of the hand with increasing weakness of the arm, especially on the right. Fibrillary twitchings were noted here and in the tongue. The tongue deviated to the right when protruded. The patient had a number of coughing spells during which she rapidly became cyanosed. Wrinkling of the right half of the tongue was noted. Later there was found weakness of the right upper extremity, chiefly of the extensors, and the right triceps jerk was feeble. Blood examination gave the following results: Hemoglobin 65 per cent., red blood cells, 3,500,000, white blood cells, 9,000, polynuclears 70 per cent., lymphocytes 20 per cent., monocytes 6, eosinophiles 2, basophiles 2. On May 28th, patient suddenly became cyanotic and dyspneic. (Pulse 120, respiration 40.) Patient showed a weak cough, the larynx was not examined. She had a number of attacks of difficulty in breathing with choking spells all through the month of April. On the 31st of April, she had a particularly severe attack, became very much alarmed and left the hospital against advice. The urine was negative. The blood Wassermann was negative, spinal fluid Wassermann proved negative. Fehling's solution was not reduced by the spinal fluid. X ray of the dorsal and lumbar spine was negative. X ray of the pelvis was negative. There was some arthritis of the right knee. The patient died soon afterwards at her own home.

Case III.—226,502. M. B., born in France, aged sixty-one, widow, housewife. The patient was admitted January 15, 1923 and discharged February 12, 1923. Her chief complaint was an inability to walk and difficulty in speech for ten months. The family history was negative.

She had had meningitis and typhoid fever thirty years ago, suffered from rheumatic fever ten years ago and had influenza three years ago. Patient has been subject to right sided headache for several years. She had had two children, no miscarriages. Menopause came on seven years ago. The present illness began ten months ago with weakness of the right leg and difficulty in speech. The weakness of the right leg became rapidly worse, soon the left leg became involved. For the past few months, she is able to walk only with the support of a cane. Four months ago she experienced dull pain in back of the neck and shoulders; there was no radiation to the arm; no paresis of hands or arms; difficulty in speaking has been more marked lately. There was occasional disturbance in swallowing and in passing food backward from the mouth to the pharynx. Patient had had a disagreeable sensation in the tongue.

The physical examination showed that the pupils were slightly irregular. Teeth seemed in poor condition. Tongue was protruded in the median line and tremulous: On active innervation the uvula deviated to the right. Marked weakness of the right lower extremity was present; there was kyphosis of the dorsal spine; speech was slow, thick and had a nasal twang; it was distinctly dysarthric. Patient noted jerkings in the right foot: Slight right facial weakness was present, visual fields and fundi were normal. Patient could not spit out well, nor pucker her lips. Had difficulty in passing food backwards, tongue deviated to the left; it showed fibrillation with some atrophy and furrowing. The right knee jerk and ankle jerk were diminished, those of the left were more active, bilateral Babinski and Oppenheim were present (right greater than left). Abdominals were diminished on the right. There was distinct weakness of the right lower extremity with hypotonia. There were similar changes in the left leg but less marked. Upper extremities were normal and sensation was intact. Blood pressure was 170/120. Examination of the larynx was negative. Blood examination showed the following: Hemoglobin 100 per cent., red blood cells, 5,120,000, white blood cells, 8,600 with a normal differential count. Patient said "tongue is as lazy to talk as the legs are to walk." Of late she had experienced difficulty in mastication. The bolus could not be passed to the pharynx, patient could not whistle. The tongue deviated to the left. Twitchings occurred in the left face. There was foot drop on the right and the peroneal group on the left also seemed weak. Temperature, respiration and pulse normal. Blood Wassermann proved negative. Examination of the cerebrospinal fluid showed no cells, no increase in globulin. Wassermann was negative. X ray of the sinuses was negative. All three of these cases showed in common, a primary involvement of the lower extremities. The findings included muscular wasting with diminution to abolition of the deep reflexes, and changes in the electrical reactions. In Case I. there were in addition, similar findings in the upper extremities and shoulder girdle. The bulbar signs appeared only terminally. In Cases II. and III., the bulbar phenomena while not definite at first formed part of the clinical picture for some time. In all of the cases there were mild evidences of pyramidal tract lesion. In Case I. the toe drop precluded the possibility of eliciting the Babinski sign. However, the absence of abdominal wall reflexes and the left ankle clonus were significant in this regard. In Case II, the absence of the abdominals in the nulliparous woman and the suspicious left Babinski, also served as evidence of pyramidal tract involvement. In Case III. the pyramidal tract signs were definite.

All of these cases illustrate what Schaffer has termed system trophism. He looks upon the upper and lower motor neurons as parts of a motor system and it might be worth while to consider this disease as one involving this system. This will explain an apparently paradoxical phenomenon in this disease, namely exaggerated deep reflexes even in limbs with extensive degenerative atrophy. This of course depends upon the predominance of the pyramidal tract injury over that of the anterior horn lesion.

Many of these cases have been labelled chronic anterior poliomyelitis. One cannot negate the occasional incidence of a pure chronic anterior poliomyelitis such as occurs, for example, in cases described by Dana and others on a luetic basis. Yet I, in common with most other observers, would include this combination of bulbar phenomena, anterior horn lesion and pyramidal tract signs under the generic syndrome, amyotrophic lateral sclerosis. In some of the cases, the bulbar signs dominate the clinical picture. In others, perhaps, the anterior horn lesion stands out as the conspicuous feature of the disease, while in a third group the lateral sclerosis with resulting pyramidal tract phenomena preponderate.

With this classification in mind, I have collected this group of cases, illustrating atypical forms of this disease which are frequently misunderstood and incorrectly labelled. I wish to express my sincere thanks to Dr. B. Sachs and Dr. Foster Kennedy for permission to report the cases from their respective services.

Arteriosclerosis of the Nervous System: Remarks on Etiology and Symptomatology*

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BASIS OF STUDY.

We have so much to learn about arteriosclerosis of the nervous system that it justifies a careful analysis of any considerable number of cases. A writer not long ago said that cerebrospinal arteriosclerosis was but little understood, and MacCullum (1), writing of arteriosclerosis in general, feels that we are extraordinarily ignorant with respect to this common affection. That ideas relative to the subject have been changing, is shown by the fact that in the last edition of *Osler and McCrae,* the chapter on arteriosclerosis was rewritten.

My interest in the subject is chiefly clinical; the material forming the basis of study for this paper consisting of the records of one hundred cases from the Philadelphia General Hospital (collected when connected with that institution), and from private practice.

ETIOLOGY.

In a perusal of numerous articles on arteriosclerosis, one cannot help but be impressed by the rather formidable list of etiologic factors enumerated. Among these we find age, sex, heredity, hypertension, infection or toxemia, diet, muscular exertion, lack of exercise, nervous strain, obesity, and glandular dysfunction.

Age.—No article on arteriosclerosis would be allowed to pass the censor without a reference to the moss grown and time worn but nevertheless true quotation: "A man is as old as his arteries." While change in the arteries is a necessary accompaniment of involution, of senility, age is relative, and can not always, pathologically, be estimated by the number of years the individual has lived. In my series, the average age of the patients when examined was 64.5 years, and it is interesting in this connection to note the close approximation to Woltman's (2) average in 146 cases studied, namely, sixty-three years. That we should find a wide variation in the ages of our arteriosclerotic patients is not surprising. They ranged all the way from forty-nine to eighty-five years, two being fifty, and two fifty-two years of age. What to me seems of more importance than the age of the patient when examined, is the age at which the symptoms were first noticed. This was recorded in seventy-four cases, and averaged 60.9 years.

Sex.—Seventy-nine of the cases were males, and twenty-one females. These figures are misleading, as a large proportion were collected from the Blockley records, where males greatly predominated. Of the private patients, a true index, the ratio was two males to one female, again coinciding with Woltman's statistics, in which males predominated (sixty-four per cent.). Dercum (3), in discussing a paper before the College of Physicians of Philadelphia, made the statement that mental and nervous effects due to arteriosclerosis greatly predominated in the male; arteriosclerotic dementia, for instance, being quite rare in the female, while intermittent claudication is practically a male disease. Norris in closing the discussion said that one sees many less cases of aortic aneurysm in women than in men, and one rarely sees extreme degrees of pipestem arteries in women.

Heredity.—All other factors being equal, there is undeniably a distinct tendency in certain families toward early arterial degeneration. Some years ago, I met a physician, who, then in the late thirties, presented a marked arcus senilis. This was so striking that I untactfully remarked about it, and was told by the gentleman that practically all of his people died of cardiovascular troubles before they were fifty. Different species of animals vary greatly as to longevity, but no adequate explanation has been offered as to why in the human species, there should be familial variations with regard to arterial degeneration and in consequence of this, to expectancy of life. Osler commented on the influence of heredity by saying that "bad material was used in the tubing," but did not tell us why the material was faulty.

In reviewing the case histories from the viewpoint of heredity, nothing of any value was found to report, but possibly a little of interest. In twenty-nine instances where the age of the parents at the time of death was recorded, of the fifty-eight parents, two thirds of the number had lived to exceed three score years and ten. Twenty-seven died between seventy and eighty years, nine between eighty and ninety years, and one died at ninety-five years. The majority were of English and Irish descent. One arteriosclerotic woman of fifty-three years who had a stroke, lost a mother and two sisters from apoplectic attacks, and a third sister, still living, had a hemiplegia as the result of a stroke. Another patient, a man of seventy, gave the following unusual family history. His father died when the patient was a child, his mother died at eighty-one, one brother died at thirty-nine, one brother was living and in good health at eighty, one sister died at seventy-six, a second sister at seventy-eight, and a third sister died at eighty-two.

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*Read before the Portland Academy of Medicine, February 8, 1923.

Hypertension.—It is commonly recognized that persistent high blood pressure leads to arteriosclerosis, but we also know that high blood pressure is not always indicative of arteriosclerosis, and that the presence of arteriosclerosis does not always mean that there is hypertension. "The terms are not interchangeable." (Norris.) Cardiac myofibrosis and cardiac dilatation are common in arteriosclerosis and with a weakened pump it is obvious that the force of the blood stream is diminished and in consequence, the blood pressure lowered. However, the average blood pressure of the patients in my series was high: 104 diastolic and 177 systolic. The three highest blood pressures recorded were: diastolic, 120; systolic, 280; diastolic, 155; systolic, 235; diastolic, 140; systolic 230. On the other hand, some of the pressures registered were abnormally low, the three lowest being: diastolic, 60; systolic, 100; diastolic, 80; systolic, 110; diastolic, 70; systolic, 112.

Infection.—Just what rôle is played by the various infections is difficult to estimate—and opinions vary. Of the various infectious diseases those most emphasized have been typhoid fever (Thayer), tuberculosis and syphilis. Focal infection has also many advocates as being an etiological factor in the production of arteriosclerosis. O'Hare, in discussing vascular hypertension, writes: "It is surprising how little part post infections or even latent infectious foci play in this disease."

PREVIOUS ILLNESS.

In reviewing the previous medical history of the patients from the standpoint of infections, typhoid fever was recorded twelve times, smallpox nine times, pneumonia and rheumatism each eight times; malaria, scarlet fever and influenza four times. One patient gave a history of severe puerperal infection. Several had multiple infections, such as smallpox, malaria, syphilis and gonorrhea, malaria, scarlet fever and smallpox; smallpox, typhoid and pneumonia. Two men admitted having gonorrhea five times and one man confessed to six such attacks.

RÔLE OF SYPHILIS.

I have never felt that syphilis was a potent factor in the production of cerebrospinal arteriosclerosis. Syphilis is inflammatory and destructive, while arterio capillary fibrosis is really degenerative. In the 100 cases, a positive Wassermann was recorded in only two instances and in five other patients a positive luetic history was obtained, although blood and spinal fluid Wassermann tests were negative. Not every case was examined for the Wassermann reaction, and while realizing that a routine examination of the blood and spinal fluid would possibly have raised the percentage of luetics in the series, it is safe to say that the incidence of syphilis was no higher than in a like number of non-arteriosclerotic patients, or for that matter, in the average of the community. Indeed, I feel that the argument could be made even stronger. The majority of the patients were well advanced in years, and the pathology of syphilis does not tend toward longevity. Thus, while the frequency with which syphilis produces disease of the aorta is well recognized, Bittorf found that in fifty-four cases of sclerosis of the aorta, the average age was 55.6 years, but the syphilitic cases averaged ten years younger.

INFECTIONS.

An interesting contribution on the relation of arteriosclerosis and cardiovascular disease to infectious diseases by Ophüles appeared recently (4). The records of five hundred consecutive complete necropsies were studied with reference to preceding infections (determined by the clinical histories and careful anatomic study.) The cases were divided into two groups—those in which all history or signs of previous infection were absent, and those in which such had been detected. It was found that chronic arterial disease was almost entirely lacking in the first group, but was found frequently in second group. It was further found that the connection did not hold in all infectious diseases, but was fairly well limited to chronic septic (rheumatic) conditions.

If this work is substantiated, it will constitute an important chapter on the etiology of arteriosclerosis, where so much has been speculation and opinion without definite proof.

Intoxications.—Much has been written regarding the effects of alcohol and tobacco in the production of arteriosclerosis. In the series, notwithstanding the fact that a large number of the cases were recruited from the derelicts at Blockley, in at least one third of the patients in whom a history could be obtained, no alcohol had been used. Something over one third had used alcohol to excess, while less than one third had used alcohol only moderately; nor was there anything to indicate that the arteriosclerosis was more intense or more marked in those who had used alcohol to excess than in the non users.

The number admitting excessive indulgence in tobacco was eleven, with fourteen moderate users of the weed. Twenty-three had never used tobacco and no history was given in fifty-two instances.

Certainly of late years, the importance of both alcohol and tobacco in the causation of arteriosclerosis has ceased to occupy so prominent a place as formerly. I believe that the human race has acquired more or less tolerance toward these poisons, and that we cannot use as comparisons the results of experimental researches upon animals. As Lloyd has expressed it, the combined ancestors of most any one of us have imbibed enough alcohol to float a battleship.

In four of the patients, lead may have been a factor; three were painters, one of whom had been treated twice for lead poisoning. The fourth case, one of the most marked examples of arteriosclerosis I have ever seen, was a printer who for years had set type by hand.

Diet.—There is still considerable discussion as to the rôle played by an excess of protein food in the diet. Most writers consider it as established that this is deleterious, while Mosenthal holds that there is no definite proof that a diet high in proteins, especially meats, is one of the main etiologic factors.

Ignatowski, (5); Newburgh and Squier, (6); and Newburgh and Clarkson, (7), have produced definite arteriosclerosis in rabbits by a diet rich in animal protein. The latter writers, while emphasizing the close resemblance between their experimental arteriosclerosis and the disease as it occurs in man, do not assert that the abuse of protein causes human arteriosclerosis, as "the vascular system of omnivorous man may have acquired an insusceptibility to the products of protein metabolism, not possessed by the herbivorous rabbit."

While not able to give any convincing facts or figures it has been my clinical experience that the most important thing is to restrict the total food intake. It is not so much what goes into the furnace as it is that the fuel be completely consumed. Middle age usually brings a lessening in the amount of exercise taken, but not a corresponding decrease in the appetite, therefore most people past the age of forty tend to overeat. The elder Horatio C. Wood, whose characteristic and forceful way of driving home a truth with an epigram is well remembered by his old students, once said in a clinical lecture, that "nine tenths of the American people dig their own graves with their teeth."

Muscular exertion.—There would seem to be no argument against the statement that continued hard physical work and exposure are contributing factors. Yet the same thing can be said of prolonged, hard brain work, especially if combined with mental worry and anxiety. It is obvious that a parallel can be drawn between the influence of hard work and exposure and the predominance of arteriosclerosis in the male sex. One of the female patients presenting marked general arteriosclerosis and dementia was a Russian, who in her younger days had worked in the fields with the men.

OCCUPATION.

In the series, the most conspicuous thing about the occupation of the patients, was the large and varied number represented, between forty and fifty, running all the way from ragpicker and street sweeper to bankers, merchants, and retired gentlemen of leisure. One was a dentist, one was a judge, while bricklayers and carpenters were represented. It will be remembered that this was before the day of what we might term nonlabor unions.

Laborers predominated, being eighteen in number, with farmers (nine) coming next. As would be expected, the locality from which the patients were drafted had something to do with their occupation, as most of the laborers were recruited from the Blockley wards and all of the farmers from the Northwest.

VARIOUS FACTORS TO BE CONSIDERED.

After all is said about the various special causes of arteriosclerosis, the condition really represents the sum total of the stress and strain of life, both physical and mental, to which the individual has been subjected, infections, toxemia, hard work, exposure, all contributing their part.

SYMPTOMS.

The symptoms of arteriosclerosis of the nervous system are naturally divided into those referable to the brain, to the spinal cord, and to the peripheral nerves.

CEREBRAL.

Of the cerebral symptoms, vertigo was recorded in forty-six per cent. of the cases, and was the most common single symptom. Stein (8), in a study of 1,026 cases, states that in the majority of arteriosclerotic patients, the ear conditions overshadow pathological conditions elsewhere, vertigo being usually the symptom for which the patients are sent for ear examination. Tinnitus is less common than vertigo, and a gradual impairment of hearing is not infrequent.

AUDITORY APPARATUS.

Eight cases in the series were recorded as having either total or marked deafness and eight more were found to have moderate or slight impairment of hearing. In the ordinary routine examination of patients, the auditory apparatus does not, as a rule, receive the attention it deserves, and slight or moderate deafness is likely to be overlooked, especially if unilateral. Moreover, unless the examination is made by an otologist, there is no information as to the nature of the deafness or of its cause.

AFFECTIVE CHANGES.

About one quarter of the patients presented definite amnesia for recent events, in more or less association with a gradual impairment of attention and association of ideas. Emotionalism was not infrequent, being most conspicuous in the pseudobulbar patients.

HEADACHE.

Headache or head pain was common, the most characteristic form being that present upon waking, gradually ameliorating as the patient would be up and about. Pain referred to the body and extremities was often complained of, but not nearly as frequently as head pain. Paresthesias were common, especially of the lower extremities, next of the upper limbs. Definite sensory loss was infrequent, but blunting of sensibility in the lower extremities was occasionally recorded.

EYE SYMPTOMS.

The pupils were found to be small and sluggish in twenty-five per cent. of the cases. This is the characteristic senile pupil. In two instances the pupils were described as being fixed. Arcus senilis was present in sixteen per cent. of patients. Homonomous hemianopsia, evidently from hemorrhage, was found twice.

It is an axiom that retinal arteriosclerosis always means cerebral arteriosclerosis, although the latter may be present without the former. Among the ophthalmoscopic signs of arteriosclerosis are a narrowing of the arteries and a dilatation of the veins, with irregularities in the calibre of the arteries, due to local thickenings of the intima. The veins may show constrictions where they are crossed by the rigid arteries. The arteries may be unduly tortuous and present an excessive brightness of the light streak, the socalled silver-wire appearance.

Miliary aneurysms may occur in the retinal arteries as well as in the cerebral vessels, and slight hemorrhages into the retina are occasionally seen.

A corkscrew appearance of some of the smaller arterial twigs, especially those in the immediate region of the macula, has been emphasized by Veasey (9), as one of the earliest signs or arteriosclerosis of the retinal vessels.

APOPLEXY.

Apoplectic attacks were noted in over one quarter of the cases. This is in marked divergence from Woltman's (2) finding of such occurrence in only three per cent. of his patients, leading him to state that too much importance is attached to them as requisites in making a diagnosis of cerebral arteriosclerosis. One cannot help but believe that the surgical character of the clinic from which Woltman drew his material may explain the difference in statistics.

Twenty of the apoplectic cases were of the hemiplegic type, and five patients gave a history of strokes on both sides, or double hemiplegia. Three in the series had apoplectiform attacks followed by marked mental confusion, but without any paralytic symptoms. One patient gave a history of having had five strokes and one of the hemiplegics was a beautiful example of motor aphasia resulting from a right sided cerebral lesion, the patient being left handed. In two instances the hemorrhage had involved the optic tract of one side, causing a homonomous hemianopsia. Sclerotic radials were found thirty-four times and sclerotic temporal arteries sixteen times.

GAIT.

The gait was described as ataxic in eighteen cases, spastic in two, and combined spastic and ataxic in four. The stuttering or stammering gait, which may be considered as pathognomonic of cerebral arteriosclerosis was found in eight patients. While many arteriosclerotics will fall suddenly because of an attack of vertigo, others will fall independently of vertigo or ataxia, from a sudden giving way of the legs of circulatory origin. This was recorded in sixteen patients, and probably occurred in a larger number. Epileptiform attacks occurred in twelve instances—therefore in twelve per cent. of patients. Eleven of these had convulsive seizures, and one a psychic epileptic equivalent. Of the twelve cases, only one gave any history or laboratory findings indicative of syphilis.

AGE.

The average age of the patients when the convulsions first appeared was 54.9 years. In no instance did the attacks begin before fifty and only once at sixty or over (sixty years.) A rather striking clinical fact was the long duration of the attacks, the average duration of the convulsive seizures at the time the history was obtained being 6.9 years. One man of seventy had been subject to convulsions for thirteen years, another of seventy-two for thirteen years, one of sixty-nine for twelve years, and one of sixty-four for eleven years. It will be seen, therefore, that epileptiform attacks, occurring in the aged, are not of bad prognostic significance as regards life.

CONVULSIONS.

In no instance were the convulsions of the Jacksonian type, although it is conceivable that localized convulsions could occur as the direct result of a localized arteriosclerotic lesion, such as an aneurysmal dilatation or small cortical hemorrhage.

In its essential features, the convulsion of an arteriosclerotic does not differ from that of idiopathic epilepsy.

EPISTAXIS.

Epistaxis, while not really a cerebral symptom, occurs frequently as one of the earlier manifestations of arteriosclerosis and we should, in this connection, be suspicious of spontaneous bleeding from the nose in a person past forty, when none of the usual causes are operative.

Although present to a slight extent in a larger number of patients, spinal symptoms were prominent in twenty-one cases, and were grouped as follows:—tabetic four, spastic four, ataxic paraplegia eleven, amyotrophic lateral sclerosis one, transverse one.

Of the four cases classed as tabetic, all had lost knee jerks, two had marked ataxia, and two had sphincter involvement. The socalled spastic cases all presented increased reflexes and stiffness of movement, but only one of the four gave a definite Babinski; one gave no toe response to plantar irritation, and two were recorded as having no Babinski. All of the eleven cases grouped as ataxic paraplegias, had ataxia, Romberg's sign, and increased reflexes, four of the number having double Babinski.

NEUROLOGICAL SYMPTOMS.

The amyotrophic lateral case was classic, with muscular atrophy, affecting chiefly the intrinsic muscles of the hands and the posterior muscles of the shoulder girdle. Fibrillation was present, the patella tendon reflexes increased, Babinski's sign present on the left and absent on the right. As the patient, a woman, was seventy-two years of age and the condition had developed gradually within a year and she had dementia, dyspnea, occasional vertigo, a systolic murmur at the apex, and a blood pressure of diastolic 80, systolic 170, I felt justified in attributing the cord disturbance to circulatory changes.

The patient classed as a transverse cord lesion was a woman of seventy-one years, apparently well until one year prior to the examination. She first noticed a prickling sensation of her toes. Two weeks later her knees suddenly gave way under her and she fell. Bladder incontinence developed only ten days before she was examined. Examination revealed sensory loss to a point five cm. above the umbilicus; she could move her toes and ankles, flex and extend the right leg, but was unable to move the left knee or hip. There was considerable muscular atrophy of the lower extremities. Patella tendon reflexes were increased; double Babinski present. Blood pressure diastolic 100, systolic 200. This patient did not present the blood picture of pernicious anemia.

I would emphasize the frequency of the ataxic paraplegia syndrome and call attention to its resemblance to subacute combined sclerosis of the cord as seen in pernicious anemia.

Peripheral nerve involvement was present to a considerable degree in only four patients, although many complained of paresthesias and indefinite pains in the extremities. This form of neuritis occurring in old age (senile polyneuritis), described first by Oppenheim in 1893, is not produced by any of the usual causes of neuritis, and is characterized by a gradual onset and insidious course, without acute symptoms: The sensory symptoms are insignificant, chiefly paresthetic, while the motor paralysis is also slight, affecting the distal rather than the proximal portions of the extremities. In advanced cases some muscular atrophy may be present.

Heart.—That symptoms indicative of cardiac pathology should be found in association with arteriosclerosis is to be expected, but the frequency with which they occurred was rather higher than I had supposed. Nine cases in the series were excluded because of an imperfect cardiac study. Of the remaining ninety-one, cardiac murmurs were recorded in twenty-four per cent. of the patients. A mitral systolic murmur was found in eighteen cases—a mitral diastolic murmur in one case; aortic systolic murmur in one case and a double aortic murmur in one case. One patient presented double aortic and mitral murmurs. The aortic second sound was accentuated in twenty per cent.; distinct evidence of cardiac enlargement in 19.8 per cent., and muscle weakness was recorded in 47.3 per cent.

Kidneys.—The average specific gravity of the urines was 1017. Fourteen were below 1015 and four above 1025. Albumin was present in varying amounts in thirty-two per cent. of the cases, and casts, chiefly hyaline and granular, in twenty-five per cent. In no instance was sugar found in the urine. Therefore, between one-fourth and one-third of the patients presented some evidence of kidney involvement.

Arteriosclerotic insanity.—In addition to the mild mental symptoms mentioned as a common finding in cerebral arteriosclerosis, one finds in text books on mental disease certain psychoses described under the headings of presenile delusional insanity, arteriosclerotic insanity, senile dementia, senile delirium, senile paranoia, etc., which, when analyzed, are but variations of the same theme.

Common to all is a gradually progressive mental deterioration, with amnesia for recent events, due to lack of impressibility. There is ready mental fatigue, a general slowing of mental processes, with diminished energy and capacity for mental work and inability to acquire new facts or ideas. Not only is all work performed less well, but accuracy is affected and judgment becomes impaired. Emotional instability is noted, the patients manifesting irritability or passing readily from one mood to another, from laughter to tears. They are lacking in sympathy, become indifferent to their friends and relatives, and often careless in their habits.

As the dementia progresses, the amnesia becomes more marked; happenings of yesterday, or even within the last few hours are forgotten; the same questions are asked, the same stories repeated. Yet incidents and facts relating to early life may still be recalled along the old and well worn memory paths of the years, not easily effaced. They become self-centred, their personal comfort or whims, often childish, assuming primary importance. The friends of a life time or the relatives who have cared for them are ignored and their senile affections not infrequently transferred to a recent acquaintance, perhaps a nurse or attendant. New wills may be made in favor of the latest favorite, excluding those who by blood ties and moral right should inherit their property. Or, the dementia may be colored by delusions of suspicion, of infidelity, or of persecution. Auditory and visual hallucinations may appear and finally clouding of consciousness and disorientation may be added. Insomnia and nocturnal restlessness become marked. Sooner or later the various physical symptoms are added; the tottering gait, the shaking hands, incontinence, ataxia, paralysis, etc., until death mercifully ends the chapter.

If evidence of general arteriosclerosis is present and the mental manifestations are accompanied by symptoms resulting from cerebral vascular disease, as vertigo, syncope, convulsions, and other conditions, we use the term arteriosclerotic insanity. Progressive mental deterioration, occurring in an old person without much associated physical evidence of arteriosclerosis, would be a simple senile dementia. When delusions appear early and the dementia and physical deterioration are relatively slight, the psychosis becomes a presenile delusional lunacy or a senile paranoia. On the other hand, we should remember that extensive cerebral arteriosclerosis may be present without any associated mental impairment.

Shakespeare has given us a remarkably accurate and pathetic picture of senile dementia in the tragedy of King Lear. Are not childishness, confusion, disorientation, amnesia and dementia all shown in these few lines?

> Pray, do not mock me.
> I am a very foolish fond old man,
> Fourscore and upward, not an hour more or less;
> And, to deal plainly,
> I fear I am not in my perfect mind.
> Methinks I should know you and know this man;
> Yet I am doubtful; for I am mainly ignorant
> What place this is, and all the skill I have
> Remembers not these garments, nor I know not
> Where I did lodge last night. Do not laugh at me;
> For, as I am a man, I think this lady
> To be my child Cordelia.

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Observations on Lumbar Puncture in Neurosyphilis*

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It is probably impossible to determine exactly when the first lumbar puncture was made, or by whom, but Quincke (1), in 1891, has the distinction of presenting the earliest lumbar puncture technic for clinical use. He was also the first to suggest lumbar puncture as a possible aid in diagnosis, though only in relation to pressure and volume. In 1902, Milian, Crouzon and Paris (2) stressed the wisdom of doing lumbar puncture in all syphilitics suffering with headache, even in the absence of other symptoms pointing to involvement of the nervous system. In 1906, Wassermann and Plaut (3) discovered that the cerebrospinal fluid of paretics reacted positively to the Wassermann test. Following such investigation on the neurological side of syphilis, this test was placed on a practical basis when Hauptmann and Hössli (4), working in conjunction with Nonne, demonstrated that the amount of spinal fluid, 0.2 c. c., the same used for blood tests, was not sufficient to give the reaction for cases with central nervous system involvement, and increased the amount to 1.0 c. c. Since that time the Wassermann test has been greatly enhanced in value by titrating the volume of fluid from 0.1 to two c. c. Beginning with these experimenters, the lumbar puncture as a diagnostic procedure has obtained more and more recognition. Without the aid afforded by lumbar puncture our knowledge of the processes in the nervous system would remain vague and obscure. In 1912, Swift and Ellis (5) published their invaluable paper on the treatment of neurosyphilis with salvarsanized serum.

In order to do a lumbar puncture, one must have a certain amount of skill and a degree of self confidence in addition to a suitable needle and a knowledge of the essential principles involved. The operation is usually carried out in the following way: The patient lies on his side with the thighs flexed on the abdomen, the head as close to the knees as possible, the arm beneath the body extended so that the patient's weight rests on the back of the shoulder and scapula. The spine is thus arched toward the operator. The space between the third and fourth lumbar spines is usually selected for puncture, although the one between the second and third, the fourth and fifth spines, or the fifth spine and sacrum may exceptionally be used. A line drawn between the highest point of the iliac crest and the lumbar vertebra corresponds to the space between the third and fourth lumbar spines. The centre of this space is then marked with iodine or by indentation with the finger nail, and the area sterilized and anesthetized with novocaine or else frozen with ethyl chloride.

The operator grasps the handle of the needle firmly between the terminal phalanx of his thumb, index and, perhaps, the middle finger, obtains his alignment, and having the patient take a deep breath, thrusts the needle straight in. If the spine is not completely flexed, he bears slightly upward. If he does not hold the needle too rigidly, it takes the course of least resistance. If bone is encountered, he withdraws slightly and redirects his point. When the dura is pierced, a lessened opposition is readily transmitted to the fingers, and sometimes a sharp snap is felt and heard. It is usually necessary to penetrate a distance of one to three inches, or even more, in an adult, and two or more cm. in a child, this, of course, depending on the build and obesity of the patient.

On reaching the subarachnoid space, the operator removes the trocar and allows the fluid to flow, turning the needle slightly if the fluid runs too slowly or if blood is mixed with the fluid. He occasionally has to introduce or withdraw the needle about an eighth of an inch, or often asks the patient to count, finding that this increases the flow. With the aid of a local anesthetic (two per cent. novocaine), the procedure, if skillfully done, will cause the patient no pain.

Reference has often been made to the dangers of doing lumbar puncture in those cases with cerebral tumors, especially where the tumor is located at the base of the brain. Nonne (6) mentions several instances of sudden death following puncture under these conditions. In questionable cases of this kind, the opinion of a neurologist is advisable.

After the lumbar puncture, the patient is placed in a dorsal recumbent position, with the head lowered. Two hours later he is allowed to turn, but is kept in bed from twenty-four to forty-eight hours and is given all the fluids he can comfortably take.

The symptoms resulting from lumbar puncture vary from a slight headache to a throbbing occipital and frontal headache with vertigo, general weakness, nausea, vomiting and collapse. Symptoms are usually absent while the patient is in the recumbent position, but immediately recur on his assuming an erect posture, medication giving little or no relief. A week's rest in bed usually restores the patient to normal, although the symptoms may persist for more than six weeks. Occasionally, a patient will have sharp pain in the frontal and occipital region upon coughing or sneezing for two to four months after a lumbar puncture.

Symptoms occur with about the same frequency in those with negative serology as in those with active neurosyphilis. After a puncture, women and neurotic patients are especially likely to develop symptoms which are not always relieved by a recumbent position, even with the head a great deal lower than the feet.

The frequency and character of the symptoms following spinal puncture have given rise to wide discussion and investigation. At one time, it was generally believed that the severity of the reaction was in direct ratio to the amount of fluid removed. In support of this theory it was pointed out that where less than ten c. c. of fluid were removed, there was less likelihood of a reaction, while with the removal of larger quantities, from fifteen to forty-five c. c., severe symptoms, and even death followed. Quincke estimated the spinal fluid pressure before and after puncture, and reported that the fall in pressure bore no relation to the amount of fluid removed. One and five tenths c. c. caused a drop of eighty-five mm. in one case, and eighteen c. c. a drop of only ninety-five mm. in another case, and he asked, as a result of his experiments, "What is to guide us in the amount to remove?"

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MacRoberts (7) has published some interesting observations in regard to the etiological factors involved in postpuncture headaches. He believes the headaches are produced by a leakage of fluid through the hole left by the needle when it is withdrawn from the dura and arachnoid. In support of this belief, he cites an instance in which although no fluid was removed a typical severe lumbar puncture developed headache, lasting eight days. He argues that it is ridiculous to think, if the headaches are due to the eight or ten c. c. of fluid usually withdrawn for diagnostic purposes, they would continue for days, when it is generally accepted that the amount of fluid formed by the choroid plexus in twenty-four hours greatly exceeds that withdrawn.

With MacRobert's theory in mind, I punctured thirty-four nonsyphilitics, twenty men and fourteen women, none of whom had ever been punctured before. These were punctured in the sitting position, and in each case I made certain the membranes were entered by gradually removing the trocar until fluid appeared, reinserting the trocar, and withdrawing the needle. No fluid was removed. The patients were kept up, and allowed to move about as usual. I carefully questioned each patient, finding that only four of the thirty-four complained of any symptoms whatever. Two of the men had slight frontal headaches the following night while in bed, the headaches lasting two to three hours and being unrelated to posture. One of these men, a leper, had received an injection of chaulmoogra oil just before the puncture, the injection having been followed by headache in a previous instance. The other man had erysipelas of the face, but was not subject to headaches. Two women also had mild headaches, not influenced by posture, nor sufficiently severe to prevent their being up. One of these had a discharging middle ear, with a secondary dermatitis of the skin, and was subject to frequent similar headaches. The other woman had received electrodesiccation for lupus vulgaris of the face immediately after the puncture.

Experimenting in an endeavor to prevent the occurrence of lumbar puncture headaches, I followed a suggestion by Doctor J. E. Moore, using a technic similar to that employed by Corbus and his associates in the treatment of neurosyphilis, substituting, however, sterile distilled water for the hypertonic salt solution. I felt if a hypertonic salt solution could cause an osmosis of the lymph fluid into the blood vessels and an increased intravascular pressure, that the reverse would take place if a hypotonic solution were used. I have often noticed where the usual amount of fluid for diagnostic purposes was withdrawn under pressure, a headache practically never developed. I punctured fifteen cases, each puncture being preceded five hours before by an intravenous injection of two hundred c. c. of sterile distilled water. The experiments resulted in my finding that there was no apparent increase in the intraspinal fluid pressure and no appreciable reduction in the severity of the headaches.

It has been my experience to encounter few lumbar puncture headaches following intraspinal treatment with serum; in fact, considering the large number of patients I have had under observation during the past few years, their absence has been striking. It has occurred to me that the explanation of their rare appearance might lie in the fact that such a large amount of serum is injected, as compared with the small quantity of fluid removed for examination at the time of treatment. I have been interested to observe that lumbar puncture headaches are less likely to occur with each succeeding puncture, and when they do follow they are less severe.

Since the introduction of subarachnoid therapy in the treatment of neurosyphilis, various modifications of the Swift-Ellis method have been tried, but no new procedure has been so universally employed, nor has any been followed by results so uniformly successful.

Intraspinal therapy as originally suggested by Swift and Ellis consisted of the administration of an intravenous salvarsan; bleeding of the patient an hour later; centrifugalizing the blood and placing it on ice for twenty-four hours; pipetting off the serum; adding normal salt solution; incubating at 57½° for one half hour, and cooling to body heat before injection.

The addition of normal saline to the serum before introduction into the subarachnoid space, as formerly used by Swift and Ellis, has been discontinued, and now the undiluted serum is added to a quantity of spinal fluid withdrawn in the receptacle. The method of adding neosalvarsan directly to the spinal fluid, as employed by Ravaut (8), Nonne and others, was soon discarded because of the cord irritation produced.

The unfortunate results of this method were largely responsible for the discredit of intraspinal therapy in this and other countries. Ogilvie (9) modified the method in question by adding a definite quantity of faintly alkanized salvarsan solution (one tenth to one half milligram) to serum, which he incubated at 55° centigrade. The procedure of Ogilvie, while an improvement over the method of adding neosalvarsan to the spinal fluid, is also one attended with some danger of cord irritation if the salvarsan is not added with great care. It is easy to add an amount of the drug which may cause cord irritation, with bladder and rectal paralysis.

Recently, Corbus and his associates (10) suggested a new method, having for its object increased osmotic properties of the blood plasma, produced by intravenous injection of a hypertonic salt solution, followed six hours later by 0.9 grams of neosalvarsan given intravenously. The authors assert that the arsenic penetration is as constant or better than in any system yet described, a slight trace to 0.01 milligram per c. c. being found in all cases except in two, ninety-three per cent. of the total number of cases. No serological results were given.

Several methods of intraspinal medication have been brought forward in which preparations of mercury are used. Sir Victor Horsley (11) advocated subarachnoid lavage, while Sicard (12) used injections of mercuric chloride, 0.1 milligram, and novocaine in saline, 0.5 milligram.

Byrnes (13) devised a treatment consisting of an albuminate of mercury solution in serum, prepared by mixing .013 to .026 milligram of mercuric chloride with twelve c. c. of human serum, and eighteen cubic centimeters of normal saline, and incubating this at 56°. The reactions that follow the use of mercury intraspinally are much more severe than those following the Swift-Ellis method, and, according to Keidel and Moore (14), the results are not so good.

In the work which I have been doing in association with Dr. Fordyce during the past seven years, we have tried various methods of intraspinal therapy and have discarded all in favor of the Swift-Ellis. We found that one tenth to one half mg. of arsphenamine could be safely added to serum withdrawn one hour after intravenous injection, but on reduction of the bleeding time to one half hour, in many of the cases there developed evidences of slight cord irritation. Since we reduced the bleeding time the results have been just as good with Swift-Ellis alone, and practically free from injurious effects.

After the lumbar puncture is done, as described in a preceding paragraph, five to ten c. c. of fluid are reserved for examination, allowing thirty to forty cubic centimeters to drain into the gravity cylinder, into which is also slowly added the serum. The cylinder is elevated and the fluid runs gradually into the subarachnoid space. Two or three times as much fluid is introduced intraspinally as is removed; thus an increased intraspinal pressure is produced. If the fluid is allowed to flow in too rapidly the patient will complain of gradually increasing pain in the coccygeal region, usually accompanied by a viselike constriction in the chest, difficult breathing, cyanosis, and weak intermittent pulse.

The reaction following a careful introduction of the serum varies from no symptoms to a mild or severe headache, shooting pains through the extremities, and occasionally nausea, vomiting and temperature of 99° to 102°. The headache is probably due to the irritating serum, or perhaps to increased intraspinal pressure and, in contrast to the typical lumbar puncture headache, is either not at all influenced by position, or else somewhat alleviated by an erect posture. The reaction ordinarily subsides in less than twenty-four hours, rarely necessitating morphine.

A course of treatment consists of six intraspinal injections, the first five of which are given at two week intervals, and the sixth at a three to four weeks' interval. With patients presenting pronounced posterior column degeneration, evidenced by ataxia, bladder and rectal incontinence, anesthesia and paresthesia in the lower extremities, the intervals between treatments should be lengthened to three to six weeks. We find that from one to twelve courses are necessary before a negative spinal fluid is obtained, the number of injections required naturally depending on the type of case. Each course of treatment is followed by a two to three months' rest.

While all lesions of syphilis have as their etiological basis the Spirochaeta pallida and have a more or less common pathological picture, the character of the medication depends upon the location and extent of the process. By means of repeated lumbar punctures, it has been almost definitely established that infection of the nervous system occurs in the secondary period of the disease, when the blood and lymph are saturated with the organisms. In this stage it is not unusual to see patients who while receiving active intravenous treatment, combined with mercury, show clinical and serological evidences of meningitis. While the meningitis in some instances may yield to further routine treatment, it is more usual to find the condition in the central nervous system progressing in spite of such medication. Here the intraspinal treatment meets its most rapid response.

Meningitis in this secondary period of syphilis can be cured by relatively fewer injections than an analagous condition in later stages of the disease.

We do not advocate intraspinal medication for patients of advanced age (sixty or above), nor for those with marked cardiac or renal disease. Advanced paresis is seldom benefitted, and, especially in those cases with marked depression or exaltation, treatment is often followed by an exaggeration of the symptoms.

Cerebral endarteritis, associated with evidences of an accompanying meningitis, often shows marked temporary improvement, but is subject to relapses depending on the degree of vessel involvement or destruction.

In early tabes and tertiary cerebrospinal meningitis of a few to many years' duration, as manifested by changes in the pupillary and deep reflexes, with either a slight or marked increase in the cell count and globulin test, a strongly positive Wassermann with high dilutions and a luetic curve, the Swift-Ellis treatment, while necessarily prolonged, frequently results in a remarkable functional restoration and a negative fluid. In cases of early or moderately advanced optic atrophy with basilar meningitis, we are often able to arrest the atrophy and secure a negative spinal fluid, with preservation of the existing vision. By the method in question, early paretics frequently show rapid clinical improvement, a reduction in the cell count and in the intensity of the globulin reaction, but we are rarely able to produce any change in the Wassermann and Gold Sol tests.

While recognizing that remissions of longer or shorter duration are frequently met with in general paresis, we believe the rapid temporary improvement which occurs in many of these cases, especially those with a high cell count in the spinal fluid, can only be ascribed to the treatment in question. Such induced remissions may continue from several months to two or three years.

Both neurologists and syphilologists recognize the similarity between general paresis and meningovascular syphilis. It is advisable, therefore, to give all patients with a doubtful diagnosis the benefit of intraspinal treatment. We are frequently astonished by the rapid and permanent results which follow combined intravenous and intraspinal therapy in patients who present the symptoms of clinical and serological paresis.

It has been definitely shown that in a certain percentage of cases treated with salvarsan alone, no arsenic penetration takes place in the spinal fluid. In my work with Dr. Fordyce, we have seen numerous patients with a history of repeated courses of salvarsan and mercury, yet with a persistence of clinical symptoms and positive findings in the spinal fluid. We have treated these cases intraspinally, and usually have seen them respond with marked clinical and serological improvement, and not infrequently with complete cure. We are therefore convinced, after an experience of years, that intraspinal medication should be given a very definite place among other methods of therapeutics. It should, however, never be employed without a thorough knowledge of the technic, and without proper laboratory facilities.

Case I.—Syphilitic meningitis. Male, aged thirty-two. Chancre in November, 1916, followed by a generalized rash and sore throat. Treatment was begun soon after appearance of the secondaries. Two months later there developed almost constant severe throbbing rightsided headache. Spinal fluid examination in May, 1917, was said to show 104 cells and weakly positive globulin, Wasserman and gold sol tests. The fluid was reported negative following three intraspinal treatments. The headache did not entirely disappear, however, and after a few months became almost unbearable. He also suffered with insomnia, loss of appetite and weight, and frequent attacks of motor aphasia. Sometimes he wandered about for several hours in a dazed condition. Patient was first seen November 20, 1917, when he complained of severe headache, nervousness and insomnia. On November 26th he became excitable, violent, and developed a delirium for several days, during which time he had to be restrained.

CEREBROSPINAL FLUID.

Date	cells	globulin	Wassermann	gold sol	serum
11/28/17	416	3+	4+to 0.4c.c.	1123321000	—
2/9/18	1	—	—with 2.0c.c.	0000,000,000	—

Treatment from November 23, 1917, to February 9, 1918. Eight intravenous injections of salvarsan, seven intraspinal injections (Swift-Ellis), sixteen injections of mercury salicylate. After three intravenous and two intraspinal injections the patient's mental condition entirely cleared and headache disappeared. A recent report from him states that he feels unusually well both mentally and physically and is able to attend to his work without difficulty.

Case II.—Cerebrospinal syphilis. Male, aged thirty-six, chancre in 1904. Since April, 1918, extremely nervous, excitable, talkative, and unable to sleep. For three weeks, wildly insane and grandiose. Patient had received since April, 1918, fourteen salvarsan injections intravenously, and twelve injections of mercury. Examination showed: pupils oval in shape, right greater than left, both reacting sluggishly to light; nystagmus; present, drooping of left eyelid; left side of face slightly drawn; right patellar and ankle jerks absent; patient grandiose and keenly excited.

CEREBROSPINAL FLUID.

Date	cells	globulin	Wassermann	gold sol	serum
12/21/18	22	4+	4+to 0.2c.c.	5555553100	4+
9/22/21	1	—	—with 2.0c.c.	1112100000	—

Treatment from December 10, 1918, to September 22, 1921. Forty-four intravenous injections of salvarsan, thirty-three intraspinal injections (Swift-Ellis), sixty-one injections of soluble mercury.

For the first three months of treatment patient continued wildly insane. Following this he gradually became normal and has remained so to the present time. For three years he has been the head of a large contracting company and does his work well. His general health is splendid. The patient was again punctured August 28, 1922, and showed a normal spinal fluid and negative blood.

Case III.—Tabes, male, aged twenty-eight, initial lesion and secondaries denied, gonorrhea in 1907. In 1917 gumma of the left great toe and numbness of left foot. This attack was followed in a few weeks by numbness in right foot and severe shooting pains in the stomach, bowels and rectum, accompanied by frequent stools. Similar attacks repeatedly since. When first seen, June 28, 1919, he complained of gradually increasing ataxia, and difficulty in voiding urine. Sexual power absent for eight months. Frequent attacks of blurred vision with fainting, and severe shooting pains in legs for six months. In 1918 patient had three intravenous injections of salvarsan, one injection of mercury and six mercury rubs.

Examination showed: Irregular pupils, unequal in size; right eye 6 m.m. and left 4 m.m., both fixed to light; right arm reflexes greater than left; abdominal, epigastric, patellar and ankle reflexes absent; patient unable to stand without holding on to something, or to walk without assistance of two canes; wide area of anesthesia around chest.

CEREBROSPINAL FLUID.

Date	cells	globulin	Wassermann	gold sol	serum
6/28/19	113	4+	4+to 0.2c.c.	2233210000	—
8/12/22	2	v. ft. tr.	—with 2.0c.c.	1111000000	—

Treatment from June 23, 1919, to August 10, 1922, twenty-three intravenous injections of salvarsan, nineteen intraspinal injections (Swift-Ellis), fifteen mercury injections.

Patient is free from pain; has regained sexual power; has no bladder weakness; his ataxia is now scarcely noticeable, and he is able to walk several miles each day.

Case IV.—Optic atrophy, male, aged thirty-eight. Chancre in 1911. In May, 1918, vision in right eye became impaired, failing entirely by December, 1918. At this time vision in left eye began to fail. When first seen on February 14, 1919, patient complained that he had been nervous, forgetful and irritable for two years, suffering also every few months with fainting attacks accompanied by nausea. He had received twenty injections of gray oil in 1911, and ten injections each succeeding year. He had four intravenous salvarsans in 1918.

Examination showed: right pupil 5 m.m. in size, left 7 m.m.; total blindness in right eye, vision of 20/30 in left eye and contraction of the fields of vision; optic atrophy in both eyes; left arm reflexes, cremasteric, and knee jerk greater than right; A_2 sound greater than P_2 and accentuated; blood pressure 132/90.

CEREBROSPINAL FLUID.

Date	cells	globulin	Wassermann	gold sol	serum
2/18/19	32	3+	4+to 0.4c.c.	1233210000	3+alco. +chol.
6/25/21	1	—	—with 2.0c.c.	0000000000	—

Treatment from February 18, 1919, to June 25, 1921, fourteen intravenous injections of salvarsan, twelve intraspinal injections (Swift-Ellis), forty-four insoluble mercury injections, potassium iodide at intervals.

Patient is entirely free from nervousness, irritability, forgetfulness and fainting attacks; has gained in weight, and general health is much better; his vision has remained stationary.

Case V.—General paresis, male, aged forty-five. Initial lesion and gonorrhea in 1903. No symptoms until about June, 1917, when wife and friends began to notice complete change in patient's mental condition. Very forgetful; very extravagant; perverted sexual desires.

Examination showed: irregular pupils, right greater than left, and both stationary to light; arm, knee and ankle reflexes hyperactive, the right more so than the left; delusions; scanning speech.

CEREBROSPINAL FLUID.

Date	cells	globulin	Wassermann	gold sol	serum
9/15/17	80	4+	4+to 0.2c.c.	5555542000	4+
8/4/20	4	±	4 to 0.4c.c.	5555432100	4+

Treatment from February 18, 1919, to August 4, 1920, forty-four intravenous injections of salvarsan, thirty-six intraspinal injections (Swift-Ellis), seventy-seven injections of mercury.

Patient's mental condition gradually cleared under treatment and after six months he was able to resume his work. In August, 1920, three years later, he again began to show evidence of mental deterioration, becoming completely insane in February, 1922, when he was committed to an institution.

CONCLUSIONS.

Headaches following the removal of the cerebrospinal fluid are not due to leakage of fluid through the hole left by the lumbar puncture needle. Experiments to prevent postpuncture headaches have, so far, proved unsuccessful.

Lumbar puncture headches follow intraspinal treatment with serum, provided an increased intraspinal pressure is produced by injecting a much greater quantity of serum than the fluid removed. Patients are less likely to have reactions with each successive puncture after the first. We have obtained better results in treating neurosyphilis with the Swift-Ellis method than with any other we have tried.

A course of intraspinal medication consists of six treatments given at two to six week intervals, the intervals as well as the total number of treatments depending upon the type of case.

We do not advocate intraspinal therapy for people of advanced age, for those with marked cardiac or renal disease, or advanced paresis, or for tabetics with evidence of pronounced nerve root degeneration.

Many cases of neurosyphilis are clinically and serologically cured by intraspinal medication, where prolonged and consistent treatment with salvarsan, mercury and iodides has failed.

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The author's references will appear in his reprints.

Visceral Neurology in Relation to Clinical Medicine*

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The manifestations of life's phenomena are primarily due to reflexes. This physiological law is present in the lowest forms, and is apparent in the highest types, although greatly complicated. Life, therefore, is one reflex after another, be it psychic, somatic (central nervous system type) or vicerovegetative in response. Should there arise abnormal interplay, outstanding features of either system become manifest, leading or portraying abnormal physiology. It is desired in this paper to stress clinical phenomena in a broad manner made apparent by implication of the vegetative nervous system, which controls visceral function. A study of visceral neurology is of great aid in reaching a correct diagnosis. It will aid them to visualize the pathways and mechanisms of the abnormal processes, and make them think of the body as an entity rather than the part suspected of disease as sequestered and autonomous.

The two large vegetative nerves of the body are the extended vagus and the sympathetic system, the latter being connected through spinal segmentation with the somatic or central nervous system, which can elucidate hidden visceral disease by superficial clinical phenomena.

This is brought about through the medium of reflexes, either pointing to the, 1, subcutaneous tissue or skin, as in segmental paresthesias, together with vasomotor and pilomotor response, and 2, by the muscular system as a defense mechanism with its attending rigidities, or if the condition be chronic leading to, 3, trophic disturbances—with its wasting of skin, subcutaneous tissue and muscle, and 4, where through complicated reflexes distant structures are involved.

To correlate this dual nervous system with the viscera in the manifestations of abnormal phenomena, one must accept in part at least the pharmacodynamic divisions established experimentally by Eppinger, Hesse, Higier, and others. Again one must bear in mind certain embryoanatomical considerations in attempting to map out the neurological fields of affected viscera. The viscera you will recollect were drawn downwards in the abdominal cavity during their embryological developmental period. There is, however, a fixed and constant specific spinal segment supply through definite connector neurones, which gives rise to visceromotor or viscerotrophic disturbance when affected. For example, if we take the female generative organs, although located in the pelvis, have their segmental connection as high up as the tenth dorsal segment. We know further from the study of primitive vertebræ, where pure segmental innervation reaches its highest development,

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*Read before the New York Physicians' Association, May 23, 1923.

that the deep underlying viscera are innervated by the same spinal segment, as the skin muscle area, directly covering it. Bearing this in mind we can readily understand how we were built up segment on segment, each level having a more or less autonomous nervous system; later developments leading to correlation as exemplified in the brain stem, basal ganglia, and finally in the formation of the end brain.

The system counteracting the sympathetic is the vagus. This supplies most of the viscera. Its function is anabolic, storing up energy, while the sympathic tends to drive its mechanism for the consumption of energy. This mechanism also comes into play when the organism is in danger of attack, the defense mechanism operating through the thyroadrenal system so well shown by Cannon.

It follows that each of the viscera receives fibres from each of these systems, and connected through afferent pathways with the somatic nervous system, which reflexly through efferent spinal nerve fibres can show phenomena at certain bodily levels—motor, sensory or trophic.

Viscera on the whole are insensitive to pain; exceptions are the ducts leading out of viscera, the genital organs and hollow viscus. It can be stated as a general rule that as long as the viscera are normal no pain is felt. Whether pain is at all felt in viscera is a disputed question. Mackenzie's view is that when pressure is made on an inflamed organ through the abdominal wall, the pain is due to a hyperalgesia affecting the overlying wall or tissues. He shows further, that the organ may be displaced, but the area of pain is constant; then, again, the area of pain extends often beyond the anatomical limits of the organ.

CLINICAL PHENOMENA AND THEIR INTERPRETATION.

Acute involvement manifests itself reflexly in muscle spasms, a defense mechanism to protect the deep seated pathological process. This is well shown in an acute inflamed appendix, peritonitis, gallbladder and in ucer of the stomach. There is also an alteration in the cutaneous sensations, i. e., paresthesias and hyperesthesia. In pathological states one can often map out belts of hyperesthesia. The fifth dorsal to the twelfth covers the abdominal viscera, particularly the fifth to the ninth. The latter segments cover the stomach, particularly the sixth to the seventh, well exemplified in the rigidity of the left upper rectus muscle. It is important to remember that the pancreas is covered by the same segments. The referred pain anteriorly is in the epigastrium and posteriorly between the two scapula. The small intestine is covered from the fifth dorsal to the ninth dorsal, mostly the eighth or ninth dorsal. The appendix is innervated from the tenth thoracic to the first lumbar, producing in acute inflammatory conditions a reflex rigidity, through the transversalis and the right oblique muscles, and also involving in the visceromotor reflex the psoas. Although these sympathetic manifestations in gastric involvement are shown by visceromotor and viscerosensory signs, the vagus system is also implicated. For example, if there should be present a peptic ulcer, then phenomena pointing to that system is shown by nausea, vomiting, a hyperchlorhydria and an increased motility of the stomach. The reflex pains are mediated as stated through the sixth and seventh dorsal segment, and felt in the epigastrium or to the left of the median line, about this level. Clinically the genito-urinary apparatus shows a large number of reflexes involving the vagus system particularly. Recent reports by Bartrina and also Lanzilotta are instructive.

In chronic visceral disease Pottinger has done a large amount of work, and his observations on tuberculous intestinal ulceration of the small intestine and ascending colon, and in fact the study of tuberculosis in general stamps him as a keen clinician.

In the classic case of pulmonary tuberculosis viscerotrophic signs become manifest. The flat pectoral muscles become atrophied on the same side as the lesion, as well as the skin and subcutaneous tissue. This reflex trophomotor phenomena if we can call it a reflex, is in all probability due to a constant bombardment of viscerosensory impulses pouring into the spinal cord, disturbing not only function, but also nutrition of the anterior nerve cells, that supply the skeletal system. The law of nervous thresholds holds good here, i. e., the synapses can be easily spanned, and we find that the other muscles of the neck and shoulder girdle on that side are often atrophied, such as the sternocleidomastoid, the scalenii and others.

It is in the realm of pure reflex clinical medicine that vegetative neurology has its greatest sway and interest. The fifth cranial nerve or trigeminous is intimately connected with the vagus, which you will remember is made up of three nuclei, in the medulla the visceral, nucleus ambiguous (motor) and a sensory nucleus in the long fasciculous solitarius. With this fact in mind one can readily see the possibility of a great number of clinical reflex diseases and symptoms.

Let us take ordinary eye strain for example; this is often accompanied by vagal stimulation, and it also holds good for nasal conditions as in nasal polyps, where we see gastrointestinal involvement, with its anorexia, often nausea, and even vomiting, hyperchlorhydria, hypermotility, often constipation, and its accompanying train of symptoms of toxic origin, leading to headaches; and as a viscious circle involve the fifth cranial nerve which supplies the meninges, which give us one type of migraine. Pressure on the eyeballs leading to the well known phenomena of bradycardia. The anginal pain of angina pectoris is due to a viscersensory response mediating as preganglionic white medullated fibres from the first dorsal to the fifth or sixth and as postganglionic from the stellate ganglion. The first and second spinal segments enter into the brachial plexus formation, and supply the inner side of the arm, which explains the mechanism of the pain transmission to the arm in this disease. This is a sympathetic pathway. On the other hand a vagus stimulation of cardiac origin is seen in the cardiac asthma where the bronchioles are affected, reflexly. In pulmonary tuberculosis the phrenic of that side is called into play, producing limited diaphragmatic motility, into which often enter the action of the intercostals. The costal portion of the diaphragm is innervated by the lower segments of the thoracic region. Artificial pneumothorax is a rational step forward in healing chronic pulmonary tuberculosis copying from Nature's methods.

It is beyond the scope of this paper to go into the subject minutely. Sherrington, Head, Pottinger, Mackenzie and Ross have done a vast amount of work in this field. The future teaching of medicine must go along lines where elucidation and interpretation of clinical systems must have a definite basis. Heretofore a disease was studied regardless of the individual, and if the patient did not show classic symptoms, we had no explanations.

Years ago in the neurological clinics, seventy-five per cent. of the patients treated were called neurasthenics; today we look upon certain functional disturbances as having a base in finer biochemical bodily changes through the glands of internal secretion and the vegetative nervous system. In other words, the title and name functional neurology should be supplanted in my opinion by vegetative neurology. I desire to mention only the affective state, fear. Modern physiology has given us a clue as to the manner of operation. Cannon's work is enlightening in this respect. Fear as an etiological adjuvant enters into the production of diabetes, exophthalmic goitre, epilepsy, paralysis agitans and a host of organic and psychoneurotic states, brought about through the mechanism of the vegetative nervous system.

Again in diseases due to anaphylaxis there is a direct connection with the vegetative nervous system. Most of its manifestations point to a parasympathetic drive. Whereas the toxic conditions usually lead to a stimulation of the sympathetic system, which means a thyroadrenal drive with its consequent increased metabolism, increased heart beat, rise in temperature, lack of bodily secretions, constipation and so on.

In health these two systems, together with the glands of internal secretion, balance themselves, a state that leads to wellbeing both mental and physical. We are, however, for certain inherent reasons, either potential vagotonics or sympathicotonics. If, therefore, some disease or situation should overtake us then the system that we have a leaning towards will undoubtedly assert itself.

Of interest in this connection is the recently conducted investigation by Van Wagenen. He conducted the Goetsch test on a group of perfectly healthy students at Cornell University, and it is interesting to note that twenty per cent. showed themselves potential sympathicotonics.

Vagotonics on the other hand may not have all their segments involved clinically. I have been searching for years for a clean cut vagotonic, and have not as yet found a pure type, conforming to the type that Eppinger, Hesse and others write about. The following three cases are vagotonics, with certain outstanding segmental involvement.

CASE I.—1539, L. J., male, aged fifty, Austrian, leather worker. His chief complaint was a marked distress in the epigastrium and precordium with nausea, which incapacitated him to such an extent that he could not work. In fact, he could not rise from his chair when the attack occurred.

This dated back two and a half years, when he suddenly began to vomit while at work. There was an interesting history that the day previous a relative who lived with him came home with what seemed an attack of influenza. This frightened him badly, for people during this period of the epidemic were dying all around him and he felt his children would contract it. Because of his distress and vomiting he was taken to one of the large hospitals in the city, where a laparotomy was done, a gastroenterostomy, and an appendectomy with no relief.

Physical examination showed his heart, lungs and abdominal viscera normal. His somatic nervous system showed that aside from a slight nystagmoid movement in the left lateral plane with an exaggeration of his deep reflexes, he was normal. The urine was normal. A diagnosis that his symptoms pointed to an involvement at the level of his autonomic system was made, and he was placed on atropine. One month later he was able to go to work; the first time in two years. Whenever we stopped his atropine medication his symptoms returned.

Blood examination revealed an increase in clotting time, together with an eosinophilia. Nearly a year and a half has passed and this patient has felt well and gone back to work. An illuminating notation on his clinical card is noted—September 16, 1922, to September 30, 1922, the patient complained again of his old symptoms. During this period his atropine medication was stopped to again study the blood picture. As a result his symptoms returned again.

CASE II.—E. S., aged sixty, born in Russia, tailor. He had had attacks of pain in the back of his head and a peculiar pressure pain in rectum, either coming at night or in the morning. His father died of asthma. He was married forty years and his wife had nine children. All were apparently well. Venereal history was denied. The bowels were constipated. This illness began ten years ago. He had been to various hospitals and institutions, but failed to get any relief. He was operated on at Bellevue Hospital by a well known surgeon for a prostatectomy and bladder operation.

Aside from having a slightly palpable liver his physical examination showed him normal. His pupils are unequal, right greater than left. The right pupil was slightly irregular in outline and showed a slight corneal opacity. Otherwise there was nothing pointing to his somatic nervous system. The Wassermann was negative.

The mucosa of his sigmoid was normal. His rectum showed some internal hemorrhoids, and a dry and granular mucosa.

The first time he was brought to the clinic he was crying bitterly from pain, begging to be relieved from his terrible pressure in the rectum and severe pain in the back of his neck. His attack had already lasted over thirty-six hours; during this time there was no moment of relief during the day or night. Examination at this time showed a flushed face, pupils showing nothing characteristic, but he was perspiring profusely.

He was placed on atropine. His attacks gradually left. They were limited to one attack a week for a short time, and then they disappeared entirely. It is an interesting clinical finding to note that his constipation cleared up with the administration of the atropine.

While atropine relieves spastic constipation the exact mechanism is not entirely clear. The sympathetic system acts on the circular fibres of the intestine, constricting them, and releases the sphincters, whereas the vagus system acts reversely. The action is probably on the intestine causing a release of the circular fibres.

This patient for five months was entirely free from pain, and had become a useful member of society and gone back to work.

Case III.—B. J., female, aged forty-six, married, born in Russia. Her chief complaints were: 1, constipation; 2, frequency of urination; 3, marked abdominal distention; 4, pain in the abdomen, lower right quadrant, and 5, vasomotor disturbances—heat flashes, sweating, etc. In addition to these symptoms there occurred periods when the patient suddenly began to feel a marked pressure in the region of the epigastrium, as if there was a large socalled lump, followed by belching, and often vomiting, which only showed mucus. These attacks usually were preceded by frequency of urination, and pain in the lower abdomen as mentioned.

The previous history revealed that this woman had a gynecological operation three years previous, following which she had her menstrual periods but twice, and then they had ceased entirely. Since the operation the patient suffered more than she had immediately following the operation. This patient undoubtedly had an endocrine imbalance and pituitary extracts benefitted her greatly, however, not to the extent that the atropine did. The relief with atropine is in both the bulbar autonomic and in the sacral divisions. This patient did not show any eosinophilia, but there was a long clotting time.

In conclusion, I would like to stress the importance of a knowledge of the vegetative nervous system in the practice of medicine either as a specialist or as a general practitioner. Surgeons in particular should bear in mind this syndrome. That vagotonia is a symptom complex, and belongs to the domain of general medicine. That it is rarely seen involving all segments, and that it exists more often as segmental or circumscribed vagotonia. That segmental or circumscribed vagotonia should be considered as vagal crises—not due to lues in this instance.

The Röntgen Signs of Increased Intracranial Pressure*

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The diagnosis of an increase in intracranial pressure is applied to a characteristic local or general alteration of the intracranial shadow. While this condition is usually a sign of some organic disturbance, it is occasionally congenital in its origin and apparently of no serious significance.

In order to understand the normal radiographic appearance of the skull, it would be well to briefly describe the normal anatomical characteristics. The primitive development of the skull occurs mostly from intermembranous ossification and usually from one or several centres for each piece of skull. Eventually narrow bands of membrane remain which correspond to sutures seen in later life (1).

The outer and inner compact layers form the tables of the skull, between which is the cancellous bone—the diploe. In the adult, the outer table varies in thickness between one and three mm., while the inner table may be 0.5 to two mm. Aside from the individual and racial characteristics, the thickness of the skull varies between three and eight mm. The thickness is not uniform throughout the skull, but is much thinner in the frontal and temporal regions than in the occipital, which part measures as much as ten mm., particularly so in the negro.

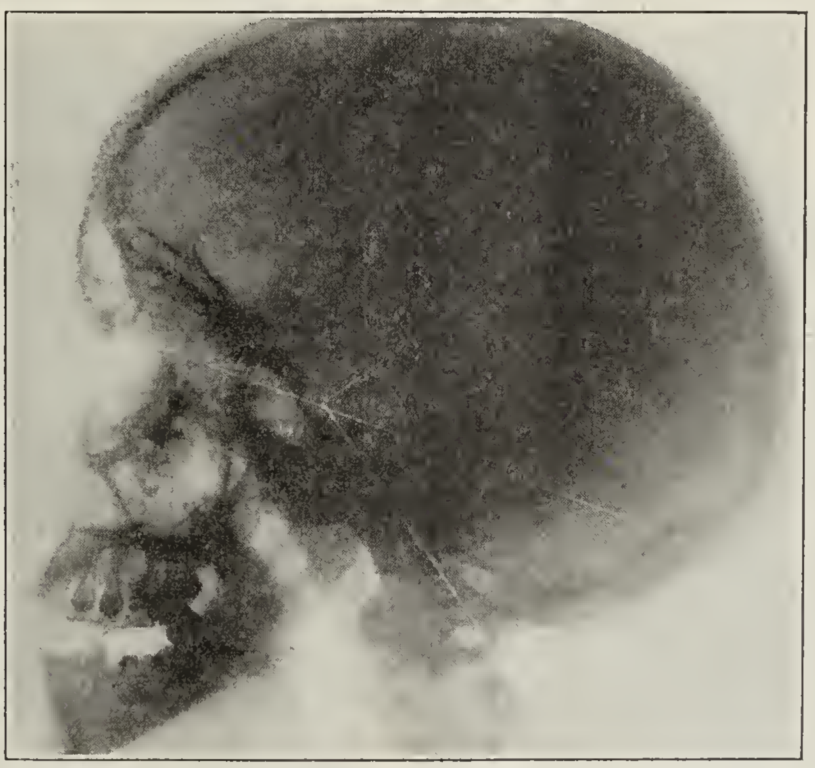

Fig. 1.—Normal skull. Subject aged nineteen. Notice homogeneous shadow of brain area. Angle of Welcker 148°.

The outer surface of the skull is rarely of smooth contour and is traversed laterally by ridges, and medially and sagitally by sutures formed by the frontal, parietal, and occipital bones, respectively. The sutures in the anterior portion of the skull become synostosed earlier than those in the posterior, and the lambdoid suture may never become completely synostosed.

Most of the cranial sutures are dentated, serrated, or a combination of both. The squamoparietal suture, termed the sutura squamosa, is formed by an overlapping of the two contiguous bones by broad beveled margins. There are several Wormian bones which are occasionally seen at the anterior extremity of the sagital suture and in the course of the lambdoid sutures.

The diploe is channeled in the adult by numerous tortuous canals which lodge the deploic veins—the frontal, the anterior temporal, the posterior temporal, and occipital deploic veins. In the aged, these veins eventually intercommunicate with each other. The emissary veins, the most important of which are the mastoid, parietal, and occipital, communicate with the intracranial sinuses. The internal surface of the skull presents depressions for the convolutions of the brain and grooves for the meningeal arteries, sinuses of the skull, and depressions for the pacchionian bodies in the superior region of the vertex.

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*From the X Ray Department, Bellevue Hospital, Dr. I. Seth Hirsch, Director. Read before the New York Physicians' Association, May 23, 1923.

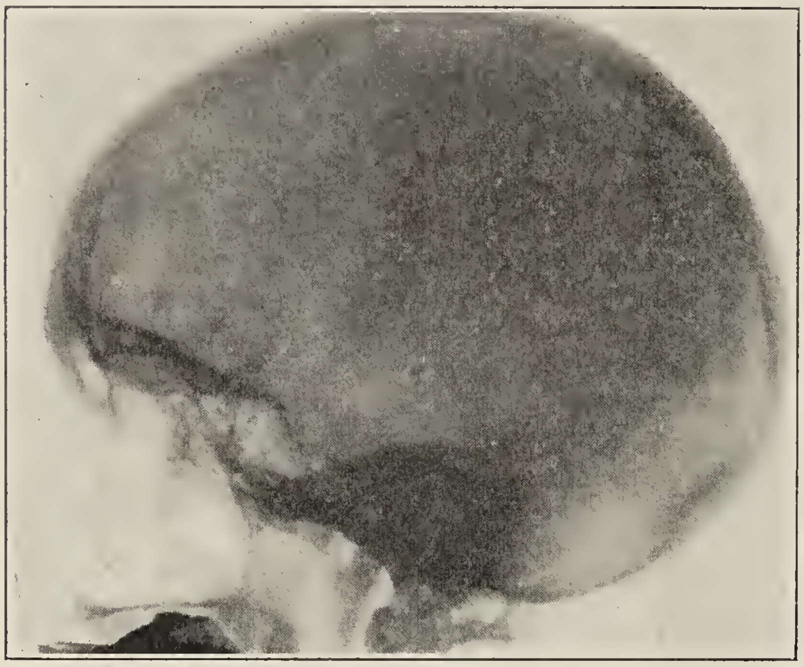

Fig. 2.—Adult normal skull; aged sixty. Notice accentuation of grooves for the middle meningeal artery.

The röntgenological appearance of the normal skull: While the skiagraph of a normal skull coincides completely with the anatomical characteristics, the shadow of the internal and external bony elements are superimposed on each other and makes a complex picture. The skull is considered as casting a dense shadow or otherwise described as an illuminated area which is fairly homogeneous. (See Fig. 1.) There are four areas on the skiagraph of a skull which appear more illuminated than the midfield. These are over the vertex, the base, the region of the anterior fontanel, and the region of the torcular herophili.

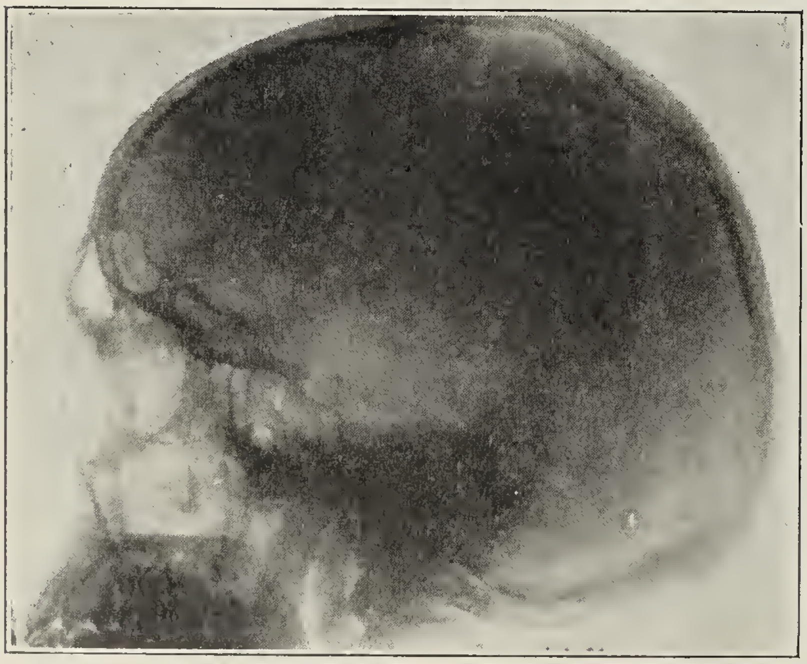

Fig. 3.—Case I.—Notice illuminated area in postcoronal region. See Fig. 4.

The physical reason for the presence of these areas is the thinness of the skull, the presence of venous sinuses, and aqueducts. The pacchionian bodies can often be seen in the postcoronal region; while the large venous acqueduct causes the illuminated area in the occipital region.

A groove for the middle meningeal artery can be visualized and usually begins about one and a half cm. anterior to the anterior clinoid process extending upward to the vertex almost parallel and posterior to the coronal suture. About two and a half cm. from its origin, this groove bifurcates, the parallel portion accommodating the middle meningeal, while the other portion of this groove runs backward traversing the temporoparietal bone for the lodgment of the posterior branch of the artery. (See Fig. 2.)

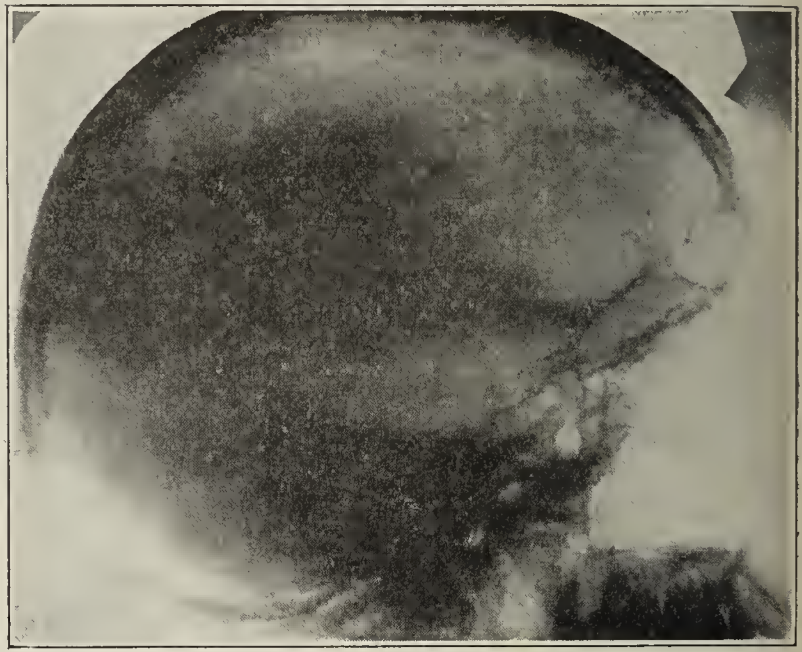

Fig. 4.—Same patient as Fig. 3. Radiograph taken eight weeks later.

The pineal body is at times visualized as a small sclerotic area in the temporal region about three or four cm. perpendicularly above the auricular canal.

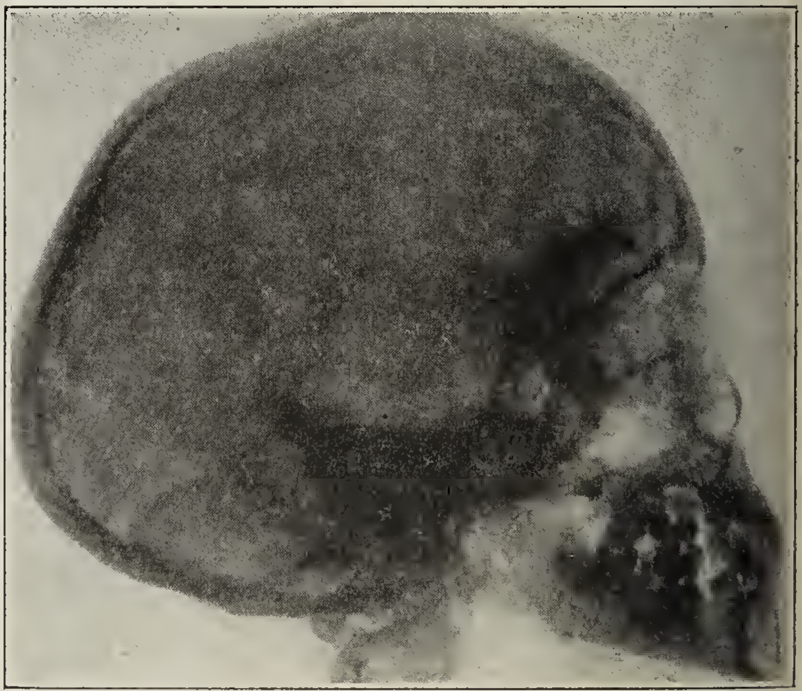

Fig. 5.—Case II.—See Fig. 6.

The symptoms of increased intracranial pressure may be, 1, local; 2, general, localizing or special (2). These symptoms depend, of course, on the type of intracranial pressure existing, and will be outlined below under the various types.

In the examination of about three thousand cases at Bellevue Hospital of which 750 were examined for evidences of injury or pathology, evidences of intracranial pressure have been observed in about seventy-five per cent. of the cases. The patients were referred with the following clinical diagnosis: Fractured skull, concussion of the brain, foreign bodies in brain, dyspituitarism, brain tumor, Paget's disease, microcephalus, hydrocephalus, temporosphenoidal abscess, epidural abscess, epilepsy, Mongolian idiocy, mental deficiency, acromegaly, syphilis, multiple myelomata, and metastatic carcinoma.

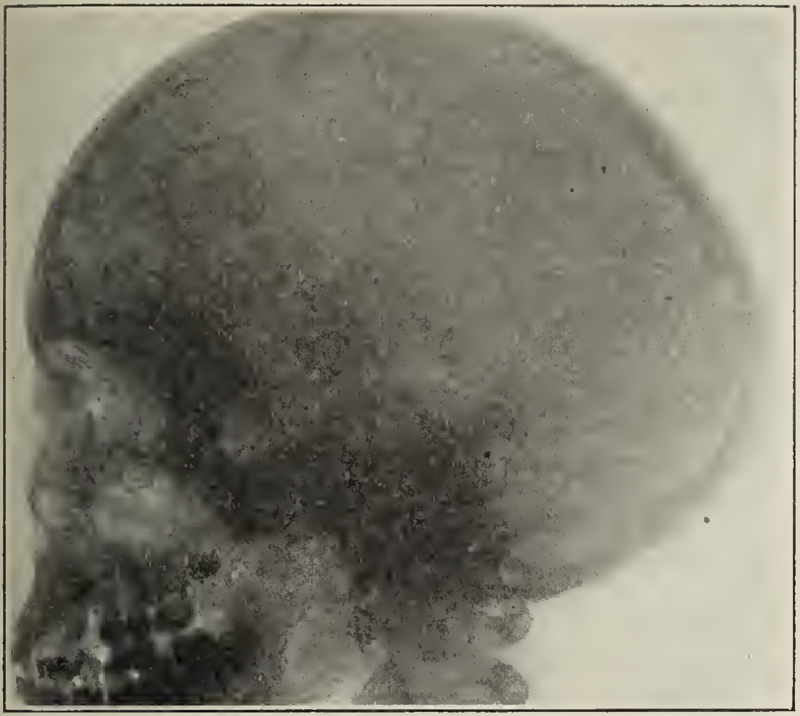

Fig. 6.—Same patient as in Fig. 5. Radiograph taken seven weeks later. Notice the appearance of the brain area.

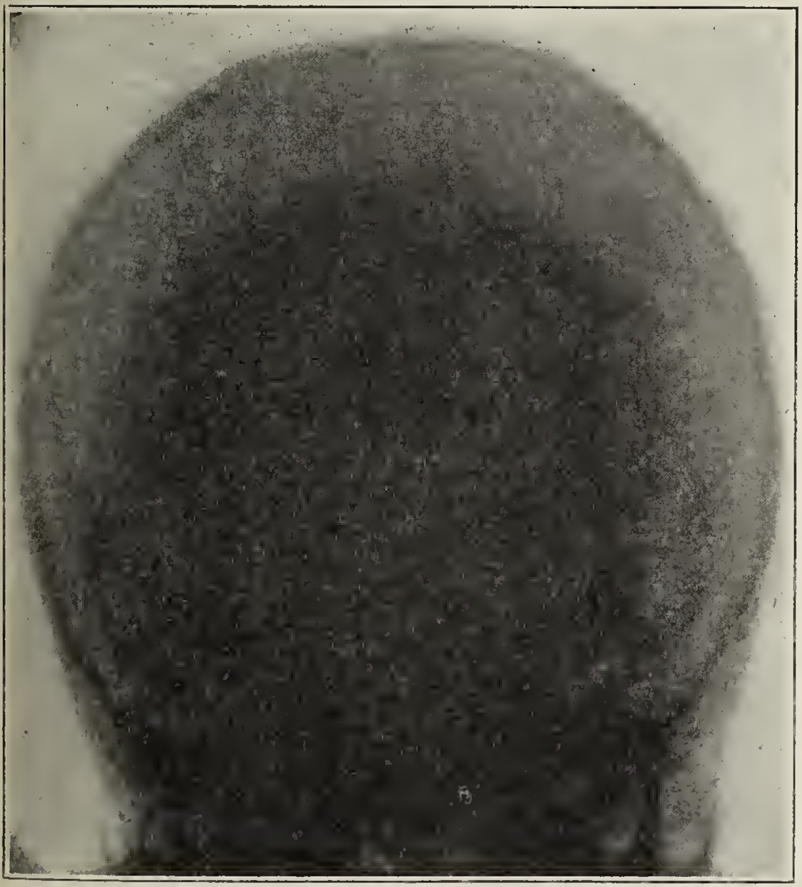

Fig. 7.—Showing a serrated fracture of the left parietal. Notice mottling as evidence of increased pressure, and accentuation of the left lateral sinus shadow.

The usual routine for examination of patients referred with the history of trauma was to radiograph the base, and skiagraph the right and left lateral views of the skull. Cases referred with a history of pathology, the additional sella turcica examination was made and also examination of the hands for dystrophic disturbances. Reexamination of the head was resorted to at intervals of from five to ten weeks after the original examination and comparison made of the first and last radiographs taken.

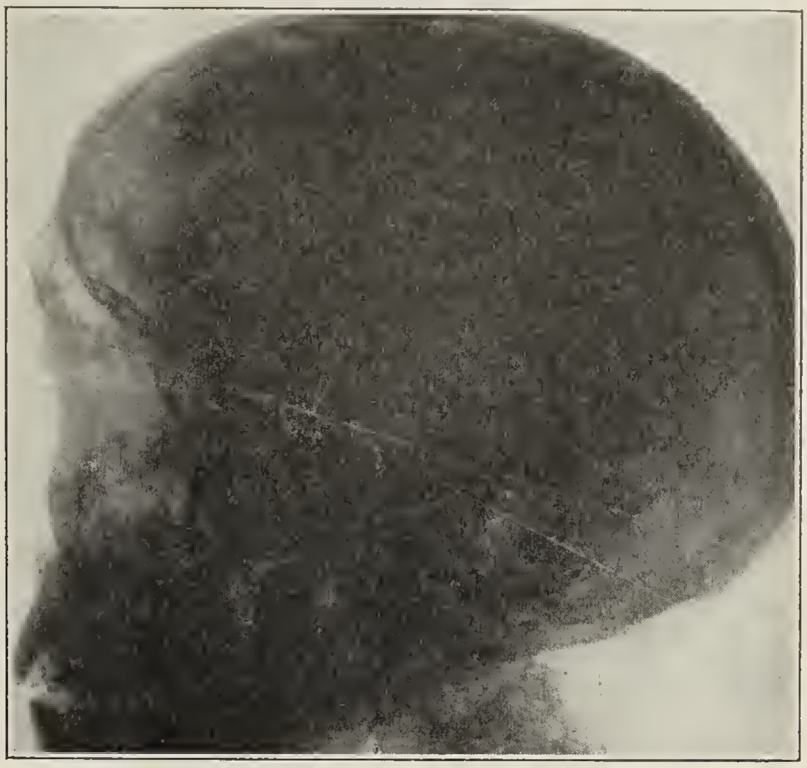

Fig. 8.—Adult aged thirty. Notice retarded cerebral development; evidence of convolutional impressions; and increase of angle of Welcker to 170°. Clinically considered, subnormal mentality.

The röntgen signs of increased intracranial pressure: Röntgenologically, intracranial pressure can be essentially divided into acute, subacute, and chronic. The acute type can readily be interpreted by observing a peculiar mottling of the skull field, better described as areas of increased illumination with intervening spaces of the normal brain shadow. (See Figs. 5 and 7.) This appearance justifies the diagnosis of a diffuse mild form of edema of the brain. This edema may arise not only from injury, but from laceration of the brain which according to Von Bergmann (3) occurs in concussion. Every case in which lumbar puncture was performed

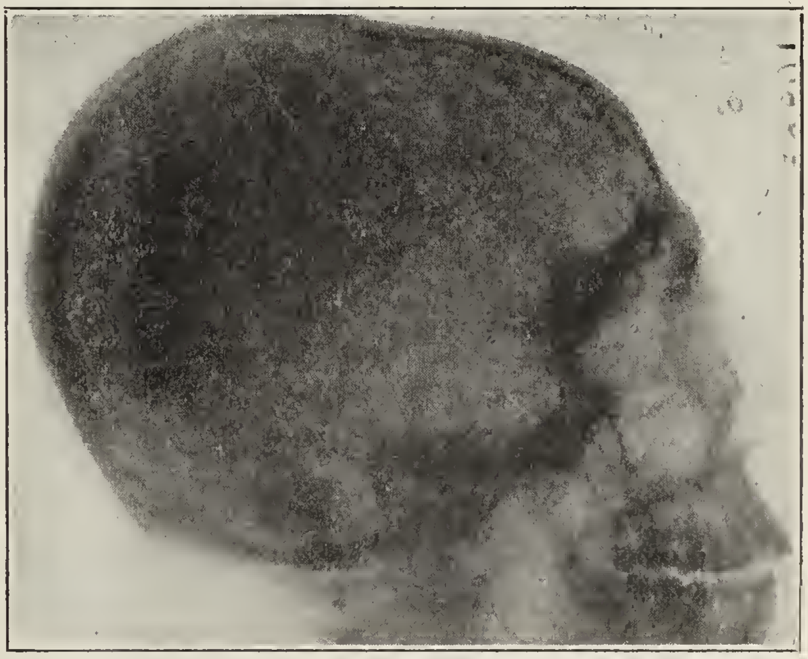

Fig. 9.—Case IV.—Anomalous skull showing intracranial pressure; depression of the middle fossa; increased angle of Welcker.

shortly after an injury, bloody spinal fluid was found even though there was no evidence of fracture.

The acute type is observed subsequent to cranial injury. In the absence of evidence of fracture of the skull, the presence of mottling of the skull field indicates the existence of concussion of the brain. The clinical findings invariably warrant and substantiate the interpretation. This mottling is usually absent in cases of extensive fractures, particularly so if they are compound in character. This can be readily explained by the relief of tension and the escape of fluid. The clinical symptoms of acute intracranial pressure are naturally of the depressive type and usually transient, although the x ray findings may persist for a period after complete recovery.

Rupture of a vascular twig in the epidural space produces the characteristic shadow of a small haematoma accompanied by the usual pressure symptoms, although no diffused intracranial pressure signs may be visualized. As an illustration, I shall report Case I.

Case I.—Male, aged thirty-seven, sustained an injury to the vertex by being struck with a blunt instrument. Clinically, the symptoms were unmistakably those of severe concussion. The radiograph (Fig. 3) visualized an area of increased illumination immediately posterior to the coronal suture. When reexamined about eight weeks later, the epidural hematoma had been entirely absorbed.

It is often necessary to recognize evidences of acute intracranial pressure even though they may be superimposed on the shadows produced by convolutional impressions of the congenital type. The following is an illustration of this condition.

Case II.—(Figs. 5-6.) The signs of acute intracranial pressure were visualized in a boy fourteen years of age who had incidentally a microcephalic head with crescentic osteoporotic areas of convolutional impressions of the congenital type. The acute concussion produced an exaggeration of mottling of the brain area. The disappearance of this condition was readily apparent when reradiographed about seven weeks later.

The subacute type of intracranial pressure is observed at a more remote period after an accident and is accompanied by certain subjective symptoms such as headaches and vertigo. Röntgenologically, the presence of subacute intracranial pressure is also recognized by the presence of mottling though not as extensive as seen in the acute form. The differential diagnosis of the two depends considerably upon the clinical history, date of injury, objective signs—though the latter may not always be present.

CHRONIC INTRACRANIAL PRESSURE.

The recognition of chronic intracranial pressure is probably the most important as an aid in the diagnosis of brain pathology. The chronic type can be divided into two forms—the congenital and acquired.

The congnital type is sometimes seen in apparently normal individuals or those of subnormal mentality. It has been observed in oxycephalic and microcephalic heads.

The acquired type has been observed in cases of injury, epilepsy, and occasionally in brain tumor. The röntgenological characteristics of chronic intracranial pressure are evidences of crescentic osteoporotic areas of the inner table of the skull which may be general or confined to the frontal, parietal, or occipital areas. Sutherland describes the evidences of intracranial pressure as seen in oxycephalic heads as "Putty finger impressions due to an atrophy of the inner table and attributed to the pressure of the convolutions (4)."

Accentuation of the grooves for the intracranial vessels is another form in which intracranial pressure may be observed. The subjective signs are at times obscure and can only be elicited by careful neurological examination. At times, however, there are certain objective and subjective signs: Asymmetry of the pupils, incoordination, headaches, optic disc changes (5), local or generalized convulsions, vertigo, vomiting, nystagmus, dyplopia, psychic disturbances, inferior mentality, insanity, and other signs. The signs simulating increased intracranial pressure which have been observed in the congenital type are also accompanied by certain changes in the shape of the skull such as exaggerated brachycephalus, oxycephalus, microcephalus, and etc. To illustrate the effect of injury to a head showing the congenital type of increased pressure, I shall report Case III.

Case III.—Child, aged eight, sustained a head injury two years prior to the x ray examination. The skiagraph visualized a moderate sized head with exaggerated convolutional impressions throughout, more marked in the cerebral area. The most prominent subjective symptom was the uncontrollable irritability and homicidal and suicidal tendencies.

Case IV.—Fig. 9 shows skiagraph of J. W., colored male, who was recently found guilty of manslaughter, but in view of the röntgenologic findings and neurological examination, he was adjudged insane and is now confined in an institution. This type of skull showing the exaggerated convolutional impressions (intracranial pressure) is of the congenital type, the clinical significance of which was a homicidal form of insanity (paranoiac).

SUMMARY.

Evidences of acute intracranial pressure are a distinct entity and occur in ninety per cent. of concussions. It is visualized in eighty per cent. of fractures. (See Fig. 7.)

The visualization of mild convolutional impressions in a person suffering from headaches, vertigo, etc., after an injury can be considered as due to trauma.

The presence of convolutional impressions in a child is usually congenital and in the absence of untoward symptoms may be ignored.

The presence of convolutional impressions in unruly children or those showing signs of inferior mentality speaks for a poor prognosis.

Intracranial lesions, or neoplasms rarely show evidences of intracranial pressure. Tumors of the hypophysis and cerebellar pontine angle produce a characteristic absorption of the clinoids and depression of the middle fossa, but no generalized evidence of intracranial pressure.

Aside from the clinical importance of demonstrating the effect of chronic intracranial pressure, the recognition of this condition is frequently a forensic necessity.

The author's references will appear in his reprints.

Tumors of the Cerebellum

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In the cerebellum, as in other parts of the brain, various forms of new growths are found. Those predominating, however, are tubercule, gummata, and the sarcomatous types of tumor. In the large series of Cushing and Elsberg, approximately two-thirds were either gliomata or gliomatous in structure.

In the brain as a whole, tumors occur with about the same frequency at all ages, although rarely after the sixth decade of life. In childhood, fifty per cent. of all brain tumors are cerebellar, while in later life the proportion drops to about twenty-five per cent. One would naturally think that the type of new growth would vary with the age of incidence, and this is found to be the case. Under twenty years, one-half are tuberculous, and the remainder gliomata, endotheliomata and sarcomata, occurring in the order named. Between twenty and forty, gummata are the most common, with gliomata second and sarcomata third. After forty, sarcomata and carcinomata predominate. Sarcoma is usually primary, while carcinoma is invariably secondary to the condition elsewhere.

Sex seems to exert some influence on the type as tumors occur twice as frequently in the male, with the exception of sarcoma which attacks both sexes equally. In some cases, heredity seems to play a part, and in a small percentage, the new growth would seem to result from a cranial injury.

The function of the cerebellum is a threefold one: 1, that of organizing the higher automatic and psychoreflex movements, 2, that of enabling the person to maintain his equilibrium and relations in space, and 3, that of giving tonus and synergy to the body muscles. Pagano, some twenty years ago, proved by animal experimentation that stimulation of one lateral lobe of the cerebellum produced motor phenomena. These varied in intensity from simple contraction of one muscle group of a limb, causing it to assume a certain fixed attitude, up to violent convulsions. He found that there were definite cerebellar zones corresponding to groups of muscles on the same side of the body. There was also a rotation of the body on its longitudinal axis, which occurred constantly from the side of excitation toward the opposite side. When he extirpated the contralateral motor area of the cerebral cortex the muscular contractions on the same side ceased, showing that the contraction was accomplished through the motor cortex of the opposite side. However, there then occurred a rotation of the body in the opposite direction, showing that the cerebellum had some action on the motor cortex of the same side, and thus on the muscles of the opposite side of the body. When both cerebral motor areas were completely extirpated, the motor phenomena were entirely abolished. When the anterior portion of the vermis was stimulated, there was an irresistible tendency to raise the head and fall backward, while irritation of the posterior portion of the vermis produced a tendency to fall forward.

The cerebellum is constantly receiving impressions from the eye, the vestibular apparatus, and the muscles of the body through the spinal cord, also in all probability from the skin. As a result of these, it elaborates efferent impulses to the central nuclei, the cerebral cortex and, through them, to the body musculature. Static equilibrium is maintained subconsciously, if not wholly unconsciously. This reflex arc passes through the cerebellum, the red nucleus, the corpora quadrigemina, the nuclei of Dieter and Bechterew, and the nuclei of the pons.

The process of correlation in voluntary movement is complex. The cerebral cortex sends impulses to the cerebellum at the same time as it sends impulses to the cord. The former pass through the crux, pons and middle cerebellar peduncle. The cerebellar efferent impulses pass through the superior cerebellar peduncle, red nucleus and optic thalamus, informing the cerebrum of all modifications in the muscular apparatus. At the same time, the necessary muscle tone is being maintained by efferent impulses from the central cerebellar ganglia.

As increased intracranial tension is an early symptom in brain tumor, let us for a moment consider the cerebrospinal fluid and its circulation. Secreted by the choroid plexus in the lateral ventricles, it passes from the third to the fourth ventricle through the aqueduct of Sylvius. Through the foramina of Magendie and Luschka in the roof of the fourth ventricle, it reaches the external surface of the brain, bathes the nervous tissue, and is finally absorbed in the subarachnoid spaces of the brain and cord. It has been proven experimentally that little if any absorption takes place internally. If the aqueduct of Sylvius is blocked by the introduction of a foreign body or if finely divided animal charcoal is injected into the third ventricle, internal hydrocephalus immediately occurs.

When we consider the function of the cerebellum and its location under the tentorium, it is not difficult to understand why the earliest evidence of tumor may be either mechanical, due to increased intracranial pressure, or functional due to interference with muscle control. In any subtentorial tumor there is likely to be early pressure on the fourth ventricle, and consequent interference with the flow of cerebrospinal fluid into the subarachnoid spaces. This may be gradual but will eventually give rise to the cardinal symptoms of headache, vomiting and choked disc. Headache may be due either to the increased pressure or direct irritation of the dura, which is supplied by branches of the fifth cranial nerve. The vomiting, usually projectile and without nausea, is caused in all probability by irritation of the medullary centre. It is commonly the earliest symptom, and childhood is frequently taken as an indication of stomach trouble. Choked disc, the most constant sign, is purely mechanical and is due to increased pressure along the optic nerve.

On the other hand, the earlier symptoms may be due to interference with cerebellar function. These commence with an ataxic stumbling gait, with general muscular weakness, especially in the lower extremities. Strabismus and nystagmus may occur early in the disease, with facial weakness on the same side as the lesion. As the disease progresses the patient tends to fall backward, or to one side, and may even fall over when sitting. Sudden vertigo is not uncommon and may go on to unconsciousness. So called cerebellar seizures occur, in which there are sudden short forced movements irregular and tonic in character, as opposed to the clonic movements in cerebral irritation. There is frequently a faulty coordination of those movements usually performed in unison, especially locomotion. Jerky movements of the hands are frequent. Cerebellar catalepsy may be present, and there is almost invariably a disturbance in the normal labyrinthine reactions.

As the disease progresses the intracranial pressure increases. Normally this varies between forty and one hundred and fifty millimetres of water, but in disease may increase to nine hundred millimetres of water. The mind becomes apathetic and sluggish. Blindness ensues with paralysis of the ocular muscles, while the pupils become dilated and fixed. The headache and vomiting decrease. The neck retracts and a positive Kernig may be present. The pulse, slow at first, becomes rapid as we get bulbar compression and finally paralysis.

In our diagnosis, we must first determine the presence of a tumor, then localize it, and finally try to determine what type of growth it may be. The progressive course of the disease, with the symptoms of headache, vomiting, choked disc, mental disturbances, the interference with muscle function, and local signs are all characteristic of brain tumor. Some of these, however, may be found in localized tuberculosis or syphilitic meningitis, lead poisoning, hysteria, internal hydrocephalus or abscess. A history of syphilis or tuberculosis, along with the age of the patient, helps us considerably, as do any signs of local tenderness, or the discovery of a new growth in another part of the body. A differential blood count helps to rule out the acute inflammatory conditions. Lumbar puncture and examination of the spinal fluid should rule out cases of acute meningitis and tuberculosis. A Wassermann of blood and spinal fluid is always indicated. As the great majority of cerebellar abscesses are due to middle ear infections a negative ear history and examination help to rule out that condition. The x ray may show a change in density of the brain, or a localized thinning of the skull, but in general is of little aid in tumors below the tentorium. At times percussion has given a duller note over the tumor, and in some cases noted by Ballance, there was a distinct bulging of the thinned out occiput over the tumor.

With tumor of the lateral lobe, we would expect to find ataxia and general muscular weakness, with diminished or lost reflexes on the side of the tumor, and a tendency to fall to that side. In the nystagmus, the eye movement tends to be slower and of greater amplitude on looking toward the side with the lesion, finer and more rapid on looking away from that side. If the tumor is in the vermis, there is greater loss of equilibrium, and a tendency to fall forward or backward rather than to the side. The great difficulty in accurate location, however, lies in the fact that in an encapsulated growth, pressure is transmitted and signs of irritation may occur at a considerable distance from the tumor itself.

In deciding what type of tumor is present, one must remember the frequency of tubercule in childhood. Often a solitary tubercule is present which exhibits all the characteristics of a tubercule elsewhere, and may reach a considerable size. Syphilomata are becoming less frequent, under the earlier and more efficient methods of treatment of the disease. They are usually associated with syphilis elsewhere, a meningitis or general arterial change. Usually they start growing in the pia, and may reach a considerable size. They are usually irregular in outline with a grayish periphery, and degenerated centre consisting of small round cells, spindle cells and disintegrated nervous tissue elements. Gliomata are the only tumors peculiar to nervous tissue found especially in the cerebellum. They constitute two-thirds of the adult tumors and are derived from the neuroglial cells supporting the brain, and not from the membranes or fibrous structures. They vary in size, may grow slowly or rapidly and are rarely encapsulated. Usually they have the appearance of congested or pale brain tissue with indefinite boundaries, and are often very vascular. The brain tissue is infiltrated and replaced by the tumor, the centre of which may undergo cystic degeneration, or in some cases a general disintegration. Microscopically they consist of small cells with intervening fine wavy fibrous prolongations. When the fibrous elements predominate, they are called fibrogliomata and when there is a preponderance of round cells, they are known as gliosarcomata.

Sarcomata exhibit a number of forms, each with its special characteristics. They may develop from the meninges, the vessel or nerve sheaths, or metastasize from sarcoma elsewhere. Both round and spindle cell types are found. They grow rapidly or slowly according to type, and not infrequently are encapsulated. The usual forms of degeneration occur. Certain slow growing types arise from the dura and contain calcareous deposits; these are called psammomata. These are white, gray or yellow in color, and microscopically show round cells, spindle cells and others of different types.

The endotheliomata originate from the endothelial tissues, often the meninges, are usually encapsulated, and if so are easily removed when found. Fibromata, enchondromata and lipomata are extremely rare. Osteomata are more frequent, but appear as calcareous plates in the dura or tentorium, and do not invade the brain itself. Carcinomata are rare and never primary in the brain. Echincoccic and cysticercus cysts are also rare. When found they are multiple, encapsulated and slow in growth. As they form in the ventricles or on the surface of the brain, they often produce no symptoms.

The prognosis in tumors of the cerebellum is always unfavorable. Tuberculosis and gummata may respond to treatment. Rarely does a tumor become encapsulated and undergo atrophy. The course of the disease is gradually progressive and the rapidity varies according to the type. Generally the symptoms become more pronounced till death supervenes in a year or two. It may occur within a month from the time the first symptoms are noted, while cases are on record which survived for eighteen years.

Medical treatment, with the above prognosis, is not very satisfactory. Tuberculosis is treated as elsewhere. A gumma may respond to treatment, and iodides have been known to benefit even nonsyphilitic cases. The ice cap is useful for headache, and the pain may be controlled by opiates. Lumbar puncture may be used to determine the intracranial pressure, but it is exceedingly dangerous to draw off much fluid in the presence of a subtentorial tumor, as the medulla is likely to be forced into the foramen magnum, and sudden death result.

Surgical treatment, while so frequently and rapidly fatal, offers the best chance in these cases. The cerebellum is more easily approached than many other portions of the brain, and brilliant results have been obtained, even where it was necessary to remove all of one cerebellar lobe. Even if the tumor cannot be localized, the patient should not be allowed to go blind for the lack of a decompression.

The most satisfactory approach to the cerebellum is through the crossbow incision of Cushing. The prominent boss on one side of the occipital bone is opened with trephine or Hudson drill, and the dura exposed. The opening is enlarged with a rongeur. If the tumor is apparent, the meninges are incised and the mass removed if possible. In cases where it is impossible to remove the whole tumor as in cases of an infiltrating type, the removal of a portion has been known to result in the atrophy of the remainder. If the tumor is not apparent, palpation may reveal its presence below the surface, when the intracranial pressure is not too great. Search should then be made with trocar and cannula, through an opening in the dura, as in a case of brain abscess. This is of help, however, only in those cases where the density of the tumor is greater than that of the brain, or where the tumor has undergone central cystic degeneration.

When the tumor is not found or is not removable, a decompression should be performed. The opposite boss of the occipital bone is removed and the ridge of bone in the midline removed carefully, on account of the midoccipital sinus and emissary veins. When the bone opening has been enlarged to a sufficient size, the median occipital sinus is divided between ligatures, and the dura excised from the area exposed by the bone opening. If possible the wound is closed without drainage. This decompression may save the patient's sight, lessen the severity of the symptoms, and allow of more accurate localization and operation at a later date.

The following case history will illustrate several features of cerebellar tumor, and some of the difficulties encountered in their diagnosis and treatment, especially in young children.

Case—R. M., aged two and a half years. Family history was negative for tuberculosis, syphilis or brain tumor. No history of middle ear trouble at any time. Apparently strong and healthy till one month before admission, when he commenced to vomit daily and was treated elsewhere for stomach trouble, with no success. On admission to hospital, examination showed a well nourished child, lying on back, fully extended, semiconscious, with head turned to the left. There was extreme flaccidity of both arms and legs, with least in left arm muscles. Reflexes: arm decreased, abdominal absent, patellar absent, right Babinski and Oppenheim, plantar flexion response on left, no clonus on either side. Horizontal nystagmus present. Sensory signs not demonstrable on account of coma. Head turned constantly to left and resisted passive turning to right. Rigidity of neck and upper spinal muscles, with occasional opisthotonus. Ataxia and stereognosis not determinable. Considerable purulent nasal secretion, and pus in the nasopharynx. Tonsils buried. Ears clear with retracted drums. Vestibular examination showed nystagmus to left with convergent squint. Eyelids kept closed. Pupils semidilated and responded to light. Both discs choked, more advanced on the left. No evidences of tubercule. Nystagmus, long component to left, unequal, left eye moving farther at times and at other times lagging on recovery. Movements not coordinated. Left eye convergent at times, other times divergent.

Temperature 99.2° F. pulse 104, respiration 22. Blood examination: red cells 3,500,000; white blood cells 16,800, polymorphonuclears 64 per cent., lymphocytes 34 per cent., eosinophiles 2 per cent.; hemoglobin 70 per cent. Blood taken for Wassermann. Lumbar puncture showed some increase in the intraspinal pressure. Fluid was clear and showed 9 cells per cmm. chiefly lymphocytes, also a slight increase in globulin. Urinalysis negative except for specific gravity of 1030.

Second day: Condition remained about the same. Took nourishment well. Cried out at times. X ray examination of head showed nothing abnormal. Left eye remained convergent. Pupils equal. Less nystagmus. Increase in choked disc.

Third day: Cried frequently, general condition the same. Lumbar puncture gave 12 cells per cmm. Wassermann negative. 11,200 white cells.

Fourth day: Child more quiet. Respirations 12 per minute. Left pupil slightly irregular and larger than the right. Left convergent strabismus when quiet. Slight nystagmus to left. No increase in choking of discs. Reflexes in right leg have disappeared.

Fifth day: Condition about the same. Respirations have dropped to ten per minute. Operation decided upon. Diagnosis: Cerebellar tumor, probably in left lateral lobe.

Operation: Through cross bow incision, dura over left lobe of cerebellum was exposed. Intradural pressure much increased, but no loss of pulsation. Left cerebellum explored with trocar and cannula. No fluid or abnormal resistance encountered. The trephine opening was enlarged to a diameter of three cm. The same was done on the right side, with no abnormal findings, and the two openings joined. The occipital sinus was ligated, and the dura excised. Hemorrhage was slight and easily controlled. After decompression, there was some herniation of the cerebellum through the opening. Wound was closed without drainage. The patient apparently withstood the operation well, but six hours after operation temperature and pulse commenced to rise, while the respirations became shallow and infrequent. After twelve hours the patient died, apparently from respiratory failure.

Autopsy findings.—A tumor was found in the right lobe of the cerebellum, at a depth of two centimetres from the exposed surface of the brain. It was three centimetres in diameter, and of the same consistency as the brain substance. It projected forward and inwards, and had exerted considerable deforming pressure on the right brachium of the pons. Its centre was yellow in color and degenerating, but not purulent. The margins were quite distinct but not encapsulated. A few small hemorrhagic points were found, due evidently to the cannula in exploration. The left cerebellum was normal, and there were no signs of meningeal irritation. The remainder of the brain was normal.

1. The diagnosis of cerebellar tumor is not usually difficult, but definite localization may be impossible.

2. It is important that every patient with persistent vomiting, especially in childhood, should have an examination of the eye grounds.

3. The course of the condition is often rapid, and the mortality very high under the most favorable conditions. Early diagnosis, however, is most essential.

4. Decompression at least should always be performed. The opening should be large enough to stabilize the abnormal intracranial pressure. If this is done, blindness is averted and a further opportunity is allowed for the more definite localization of the tumor.

Confused States Following Infections*

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Periods of confusion, lasting from a few moments to several hours, are commonly encountered in people suffering from cerebral arteriosclerosis. These periods vary from mere momentary lapses of content of thought or mild momentary states of confusion, to complete disorientation and states of bewilderment lasting for several minutes or even for hours. These people may suddenly stop for one moment while holding a conversation and appear momentarily dazed; and then pick up their former trend of conversation. They may, however, be unable to resume their topic of discussion and inquire as to the subject about which they had just been talking.

Occasionally such lapse of consciousness may be associated with motor phenomena such as twitchings of some extremity, and they may experience sensory disturbances in the nature of paraesthesias in some part of the body. In the more serious cases, such lapses of consciousness are often associated with anxiety and considerable apprehension. Physical examination of such people will reveal evidence of cerebral arteriosclerosis and possibly of general arteriosclerosis as well. The blood pressure is, as a rule, high, and the urine frequently shows a low specific gravity and a faint trace of albumen. Mentally these people show a lowered mental tension, with emotional instability and occasional periods of irritability.

There recently came under our observation a group of cases who had been previously treated for general arteriosclerosis by their family physicians, and who, following some mild infection, showed marked changes in their behavior which necessitated observation in a psychopathic ward. These patients showed marked fear reactions, anxiety, visual and auditory hallucinations, and persecutory delusional trends. They were completely disoriented, and frequently misidentified those about them. Physically they showed a somewhat undernourished condition, heart showed poor action, and the blood pressure, however, was relatively low. The eye grounds showed evidences of arteriosclerosis, and the peripheral arteries were moderately thickened. The urine showed albumen, low specific gravity, and an occasional hyaline cast. There was, as a rule, no leucocytosis. Blood chemistry in these cases revealed nothing of significance. The tongue was dry, red, and deeply furrowed. The bowels were constipated. The deep reflexes were uniformly accentuated, and there were no pathological reflexes present. Sensation was, as a rule, intact. The cranial nerves revealed nothing pathological except for slightly irregular pupils which were sluggish in their reactions both to light and accommodation. The temperature rarely went above 100 and the pulse varied between 70 and 100.

They showed frequent outbursts of excitability which was due to marked fear and apprehension, resulting from their delusions and hallucinations. They would ask for protection from their imaginary enemies, and never were quite fully convinced that no harm would come to them even after repeated attempts at assurance on the part of the nurses and physicians that they would be fully protected.

After rest in bed, forced fluid intake, high colonic irrigation, the pathological mental states of these patients would, at the end of from one to two months, gradually clear up. The blood pressure returned to above 150, the tongue assumed a more normal appearance, heart action was stronger and general physical condition would be much improved. Mentally, they never showed full insight into their condition—they were amnesic for the acute period of their illness, but never seemed to fully appreciate that they had undergone a serious mental illness. Their entire recovery seemed to coincide with their steady rise in blood pressure to over 150, so that as soon as that point was reached a favorable termination would be prognosticated. The following cases will illustrate this condition.

Case I.—Male, aged forty-seven years, pharmacist by occupation, married. Admitted on April 18, 1922, being transferred from a private sanitarium. The family history was negative. The patient had been working quite steadily at his business and had rarely taken any real vacation. For several years he had consulted his private physician for high blood pressure which usually ran in the neighborhood of 200. At the same time he had had sugar in his urine.

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*From the Psychopathic Service, Bellevue Hospital, N. Y. Read before the N. Y. Academy of Medicine, Section on Neurology and Psychiatry, April 10, 1923.

About three weeks prior to his admission, the patient had a few furuncles on the back of his neck, which, however, yielded to ordinary surgical treatment. He then became somewhat suspicious, thought people were trying to rob him and seemed morbidly fearful. He appeared quite irritable and quarrelsome. He got an idea that he could not go to bed, as he might die. He then became unreasonable, and unmanageable. He became physically weak. He was taken to a private hospital and there definite delusional trends developed; thought he was being doped to death by hypodermic injections; became resistive, and it was necessary to have him sent to the psychopathic wards of Bellevue Hospital. On admission the patient was quite confused, dazed and bewildered; he would not allow anyone to approach him; he was suspicious of everybody about him; was disoriented in all fields. He spoke at random; at times he would run out of bed apparently reacting to his hallucinatory experiences. Physically he showed a foul breath; red, dry tongue; markedly accentuated deep reflexes; heart sounds were rather feeble and distant; his urine showed a specific gravity of 1010; a faint trace of albumen, no sugar, a few epithelial cells and no casts; his pupils were somewhat irregular but reacted fairly well. His eye grounds showed definite arteriosclerotic changes. His blood Wassermann was negative. His blood chemistry showed N. P. N. 34 mg. per 100 c. c. of blood; sugar 145 mg. per 100 c. c. of blood; carbon dioxide 68. He had 9,000 white blood cells and 75 polymorphonuclears. Blood pressure 130/85

For three weeks the patient was confused, and at times excited. He spoke of cans of ether being thrown on him; was very suspicious of those about him; did not recognize his wife or child. He was restless during the night. At times he would break out into attacks of screaming or shouting, and it was found necessary to restrain him in bed. Occasionally he was incontinent. During this time frequent urine examinations showed a specific gravity of 1010 to 1020, moderate traces of albumen and occasional hyaline casts. His blood pressure varied from 130 to 140. His mental state then gradually began to clear; began to recognize the members of his family; complained of great sense of weakness, but never appreciated his real mental and physical state. His blood pressure gradually rose to above 150, and the general tone of his heart musculature improved. He slept fairly well and took his nourishment quite well. He was discharged on May 15, 1922, apparently recovered from his attack.

CASE II.—Male, aged sixty-four, white, married. Admitted May 18, 1922, with a history of having been confused and excited for three days. The family history was negative. The patient had always been of tense makeup, but of good habits; had worked for over twenty years with the gas company and had never had any difficulties. He had been receiving treatment from his family physician for high blood pressure. One month prior to his admission the patient had a general cold in the head, sneezed a good deal, had a running nose; then began to cough and at the end of a week took to bed. He then began to show general increasing irritability, impatience, and spoke a good deal more than was necessary. One week before admission he complained of pain in his extremities. He then became restless, confused, misidentified people and imagined that he was at his work ordering his subordinates to perform certain duties, etc. On admission the patient showed definite evidences of arteriosclerosis. His pupils were equal and reacted well; eye grounds showed definite arteriosclerotic changes; all his deep reflexes were accentuated; there were no pathological reflexes elicited; there was a soft, blowing systolic murmur at the apex; there was a tremor of the tongue and hands; tongue was heavily coated; red in spots and dry. His blood pressure was 130/65; his urine showed a specific gravity of 1012, a trace of albumen, and an occasional hyaline cast. His blood chemistry showed N. P. N. 34.5 per 100 c. c. of blood; creatinin 1.5 mg. per 100 c. c. of blood; and carbon dioxide 60 . . . blood Wassermann negative; blood count white blood cells 6,500—82 polymorphonuclears. Mentally he was confused, restless, spoke in an incoherent, rambling manner, and had a definite occupation delirium; throughout he showed marked fear reaction; he would often jump from the bed, look about the room saying that he had just heard people were following him or that they were threatening him. He had frequent lucid intervals especially in the middle of the day, but he was very much worse in the morning and evening. He was sleepless most of the time. At the end of three weeks he gradually improved. His blood pressure rose to 160/85; he would sleep the greater part of the night and would take his nourishment. His tongue assumed a more normal appearance. He gradually cleared mentally, but he had only partial insight. It was possible, however, to discharge him on June 13, 1922,

CASE III.—Female, white, aged fifty-six, United States, widow. Admitted June 6, 1922. A relative of this patient, who happened to be her physician, stated that he had been treating her for the past four years for general arteriosclerosis and hypertension; that her blood pressure would frequently rise to 220 systolic and her diastolic never went below 100. For two weeks preceding her admission she had had a general rhinitis and pharyngitis and had had a temperature of 101° to 102°. For about three days preceding her admission she had been somewhat confused; had complained to him that the board of health was going to dispossess her and that she was going to be killed. She had refused to go to bed as she feared that harm might be done to her. On admission the patient showed a well developed but poorly nourished physical condition. Her pupils were equal but irregular, in outline, and reacted sluggishly both to light and to accommodation. Eye grounds showed definite arteriosclerotic changes. The speech was somewhat indistinct. The tongue was red, partly coated and dry. The breath was foul. All deep reflexes were accentuated. There were no pathological reflexes. There were tremors of the tongue and hands. Her blood pressure was 135/80. The heart showed distant sounds with a systolic murmur at the apex. Her urine showed a specific gravity of 1015, traces of albumen and several hyaline casts. Blood Wassermann was negative. White blood cells 8,000 and polymorphonuclears 85. Mentally the patient was quiet but definitely suspicious. Never complained of any physical weakness or any physical condition; stated that she was feeling very well but that there was a plot to harm her; when a door bell would ring she would jump from bed and would say "there they come for me now; please don't let them dispossess me." She insisted that the board of health would dispossess her and that she would be killed during the night. She misidentified the patients about her and stated that they were agents of the board of health. She had lucid intervals especially during the middle of the day but she was quite fearful and confused in the early morning, and apprehensive during the night. After two weeks of hospital residence her physical condition gradually improved, her blood pressure rose to 155/90 and her mental condition also gradually improved. She was still suspicious and somewhat apprehensive. At the request of her relatives and physician she was discharged to their custody July 18, 1922, having partially recovered from her attack.

In conclusion, it is quite obvious that we are dealing with patients who have had cerebral and general arteriosclerosis. These patients have all had a mild infection to which they reacted poorly. Physically they showed a generally undernourished condition, poor heart action, accentuated deep reflexes, practically no leucocytosis, low blood pressure, and albumen and casts in the urine. The Wassermann was negative.

Mentally these patients showed marked fear reaction, confusion and disorientation; they misidentified those about them, had difficulty in perception and in association; admitted hallucinatory experiences and expressed some nonsystematized delusional trends. With rest in bed, forced fluid intake and care of their gastrointestinal tracts, their general condition and mental state improved, and it was possible to discharge them at the end of two to three weeks of hospital residence and after an illness of approximately one to three months' duration.

Report of a Case of Chorea

By R. SHEEHAN, M.D.,
New York.

This case is reported because of the occurrence of symptoms immediately following an injury and the cessation of pain with the beginning of the choreic movements.

HISTORY.

Case.—A boy, white; aged nineteen; born in the United States, occupation, mechanic's helper. He complained of jerky movements of the left hand, arm, shoulder and head which stopped during sleep. He stated that he has been nervous the past three years, that he has had family difficulties, particularly disagreements with his married brother over financial matters, and that he was irritable and had a violent temper. Last year he had attacks of pain and cramps, with difficulty in moving his legs which he described as rheumatism. He attributed these to the fact that he worked in an icecream factory where he was in a refrigerator for hours at a time. He had also stuttered for a number of years.

He further stated that on April 28, 1923, while working under a motor car he was using a wrench to tighten up a nut when it slipped and allowed his left forearm to strike against the frame of the car. He kept on working until the next day. That night he had pain in the arm and could not sleep. He went to a hospital where it was believed that he had a fracture of the wrist, but this was not substantiated by x ray examination, which was negative. He was given massage and baking of the arm. About May 5, 1923, his left arm started to jerk and has continued to do so, gradually getting worse.

Physical examination.—He was five feet five inches high and weighed 132 pounds. He was well built and of good musculature, chest measured 33 inches. The respiratory excursion was three and one-half inches. These was nothing abnormal regarding the heart, lungs or abdomen. The pulse was regular and of good quality, rate 76 sitting. The blood pressure was 120/85. There were no abnormalities of the joints, extremities or vertebræ. If he had an injury of the left wrist, it was not evident at examination.

Neurological examination.—There was no disturbance of gait or station. There was no subjective dizziness. There were spontaneous movements of the left arm, hand and shoulder which were quick, coarse and wide. There were also jerky movements of the head and spasmodic twitching of the mouth and eyeballs. The movements of the hand and arm interfered with coordination so that he had difficulty in making purposeful movements. These diminished with rest and relaxation. The movements were asynergic in character and entailed inability to make well adapted movements. In picking up objects, the hand was overwidely opened and in the coordination tests there was a well marked tendency to overshoot the mark. The superficial and deep reflexes were present and normal, except that there was a moderate left Babinski and Chaddock and the left plantar reflex was increased. There was no clonus. The grip of the left hand was reduced, being fifteen pounds, as compared with eighty pounds in the right. There was no alteration of sensation. There were no paralysis or neuritides.

The pupils were equal and regular and reacted normally to light and accommodation. The sympathetic and consensual reflexes were normal. There was no strabismus, diplopia or ptosis. There was no nystagmus but coarse, spasmodic twitchings of the eyeballs. There was no alteration of the color of visual fields. There was no impairment of the special senses, except speech which was stuttering and frequently gasping in character. This was not intrinsic, but due to the spasmodic movements.

He had a normal degree of insight and judgment. There was no defect of memory or intelligence.

Editorial Articles

THE INDICATIONS AND CONTRAINDICATIONS OF SPINAL ANESTHESIA

Although many surgeons, especially Chaput and Jannesco and his collaborators, have desired to make spinal anesthesia a general procedure applicable to every kind of operation on any region of the body and to take the place of general narcosis with ether or chloroform, it is probable that the majority of the surgical profession at present regard it as either a method of exception, or else as a method applicable in certain cases, but not in all. This is unquestionably the most rational view. Spinal anesthesia, whether stovain or some other similar drug is employed, has its indications and it is evident that the site of the operation is its principal indication. In spite of the enthusiasm and extension given to this procedure of anesthesia, particularly in Roumania, by Jannesco's technic, it is nevertheless true that it is above all indicated in operations on the lower limbs, anoperineal region, pelvic organs and gynecological operations in particular.

Many surgeons maintain that it is to be used only in operations involving structures below the umbilicus, but experience shows that when Jannesco's technic is employed with exactitude and manipulated with skill and prudence, the indications can be extended to all cases in which a sufficient anesthesia can be obtained by an injection given low down, that is to say in the dorsolumbar region, consequently in the majority of abdominal operations.

In those cases where spinal puncture must be made in the dorsal region in order to obtain the necessary anesthesia, that is to say for operations on the thorax and upper limb, a certain reserve is in order. It cannot be denied that many surgeons and Jannesco in particular, have obtained perfect anesthesias without accidents by high puncture, but generally speaking the anesthesia obtained in these conditions is very often imperfect. The technic is more difficult and necessitates great skill on the operator's part, not so much for the puncture itself as for the position to be given to the patient, as well as the dose of the anesthetic employed. Finally, spinal anesthesia would seem to have very exceptional indications in operations on the skull, face and neck as its use in these conditions entails real danger.

Besides the question of the site of the operation, spinal anesthesia has other indications. It possesses unquestionable advantage in army surgery or in country surgery, by doing away with an extra assistant often difficult to find. It also has advantages of another order. The patient, although insensible to pain, is conscious during the operation and in cases where his consent may be necessary for extending an interference, that is to say, removing some important organ not thought necessary before the operation, this is of utmost importance to the surgeon.

Lastly, in a general way it can be said that lumbar anesthesia is indicated precisely when there are contraindications for general narcosis from the presence of organic cardiac lesions, a renal or pulmonary process or a profound organic decline. Jannesco maintains that there are no contraindications for spinal anesthesia but in spite of his high authority in the matter, we believe that operations on the head and neck should be regarded as distinctly contraindicating this form of anesthesia, unless any other procedure of narcosis is impossible, a condition unlikely to be met with in practice. Jannesco believes that age has no bearing on the indications for the use of lumbar anesthesia and yet some competent observers maintain that it is more indicated in elderly subjects than in young because of the thickness of the scaglial which prevents diffusion of the anesthetic solution. Another contraindication is chronic visceral suppurative processes, arteriosclerosis and affections of the central nervous system, as well as renal or hepatic insufficiency when these are detected, as they should be, before operation is undertaken.

MENTAL CLINICS FOR CHILDREN

One of the notable steps taken by preventive medicine in the last few years has been the establishment of many outpatient clinics of various kinds, especially those for the care and treatment of patients suffering from nervous and mental disorders. These are of two main types—those for adults, conducted by various institutions; and those for mentally defective and unstable children. In New York State, the first type is under the supervision of the State Hospital Commission, and the second under the direction of the State Commission for Mental Defectives. In some of the largest cities a number of these clinics are connected with hospitals, private individuals, or welfare organizations.

Dr. Sanger Brown, 2nd, chairman of the State Commission for Mental Defectives, made an address on the subject of these clinics, especially those for children, at a recent conference at the Utica Hospital, which has been reprinted in the *State Hospital Quarterly* for February.

In these clinics for children, various organizations are interested—welfare organizations, the children's courts, and particularly the Department of Education, which employs a psychologist and a psychiatrist to examine school children showing evidences of mental defect or instability, and a director to oversee the formation of ungraded classes throughout the State. It carries out recommendations in the schools as to the kind of education for individual children, and as to the formation of ungraded classes in the district, but does not attempt examinations on a broad scale. Children's clinics are now being operated by the State Commission for Mental Defectives in twenty-two towns, and nine other places have asked for them. Some of these clinics are held every week, some every two weeks, some once a month, and some only occasionally.

A clinic originates somewhat as follows. A town or city sends in a request for provision and supervision for the mentally defective and delinquent children of the vicinity. Sometimes it is desired that an ungraded class be established in a school. The request may come from the children's court, from local physicians, or from social workers who need help with difficult children. The psychiatrist or one of the commission's field workers then makes a survey of the situation in the place from which the request comes, gets in touch with local physicians, judges, school officers, welfare organizations, etc., and, if it seems advisable, makes arrangements for establishing the clinic. The State Charities Aid Association attends to the publicity work by notices in local papers, announcement of clinic days, and the giving of other necessary information. A building is obtained, and the difficult work of furnishing an adequate staff undertaken. The social work and mental testing are done by the field agents of the commission, of which there are now five, one in the western part of the State, one in the northern, one in the central part, and two in New York City. The physicians are secured in various ways. The commission's psychiatrist attends some of the clinics, one or two are reached by local physicians in the community, a few come from the State hospitals, and some are furnished by the State schools for mental defectives.

The children are examined physically and mentally, and a social survey and school investigation are obtained. A diagnosis is made as far as is possible at the clinic, and the field workers attempt to follow up the case and to carry out the recommendations. About 2,000 cases have been examined at the clinics in the past two years. So far it has been the policy to emphasize the close association of the clinics with the schools. When a clinic is to be established, the psychiatrist with the department of education notifies the local principal, a procedure which tends to enlist the assistance of the teachers in carrying out the recommendations, and to encourage them to send cases to the clinic for observation. The commission, which wishes to keep a register of mental defectives in the State, and the department of education, which wishes to list all mental defectives in the schools, are furnished with clinic records, which cannot of course be complete, but which act at least as case summaries.

In these clinics problems in the whole field of child psychology are met with, as well as many types of mental defect and psychoneurotic personality. Physical defects as factors in mental retardation are found, and various forms of mental disorder resulting from physical illnesses. All kinds of delinquency and conduct disorders are dealt with. Results of treatment, however, if the recommendations can be carried out, are most gratifying.

Dr. Brown closes his paper with a plea that the State will see its way to supplying more field workers and medical officers, as the present number is far from sufficient. He believes that the most economical way to conduct the clinics will be to combine those for adults and children, at least as to place, time, and staff. When these clinics become firmly established as a State activity, their value as aids in the mental hygiene program will be doubled.

THE VARIATIONS OF ENTROPY IN CERTAIN MENTAL PROCESSES

Thermodynamics are a part of experimental physics which study the transformation of mechanical work into heat. The first condition is that there shall be equivalence between the heat produced and the work expended. This is the Joule-Mayer principle. The second condition is that it is easier to transform mechanical work into heat, than heat into work. This is the Carnot-Clausius principle.

Energetics (Rankine) is the study of physical phenomena by means of results obtained by generalizing the principles of thermodynamics, which then respectively become: 1, the principle of preservation of energy—the forms of energy interchange without modifying the quantity of total energy; 2, the principle of degradation or dissipation of energy, or principle of the increase of entropy.

Heat is the most stable of all forms of energy. The latter has a tendency to become transformed into heat which also appears as a kind of product of excretion of mutual metabolism of the other varieties of energy. As a consequence, any possible phenomenon is accompanied by an increase of entropy (irreversible) and no phenomena are known which occur without a variation of entropy (reversible). Briefly, in the universe the quantity of energy remains constant and the quantity of entropy cannot decrease.

As a conclusion it may be said that since preservation of energy and increase of entropy are two conditions of physical phenomena as time and space are two conditions of psychical phenomena, one may consider space and energy, and time and entropy, as two notions equivalent to one condition.

To demonstrate the logic of this conclusion, it must be proved that the principles of energetics apply to mental phenomena. These proofs are of two kinds, indirect and direct. As indirect proof, phylogeny offers a marked analogy of constitution between the muscular and nervous system, while the physiology of the muscular fibre is almost identical to that of the neuron. The same mechanical conception explains the functions of both organs; both are electrocapillary systems. Finally, in both, heat is a product of excretion; or, each one degrades energy and increases entropy during its functioning.

The direct proofs should show in the first place that not only the neuron transforms energy—the study of the time of reaction, but also that it degrades it, as is demonstrated by the data obtained by means of the Weber-Fechner law. This socalled law simply signifies that any preliminary excitation of the nervous system has increased its entropy—stability—hence rendering it less sensitive to a second excitation.

Applying these conclusions to diseased nervous systems, such as are represented by the mental states in hereditary degenerates, it may be said that normally the entropy constantly tends to undergo an average increase in the individual and his descendants (irreversibility). When this increase becomes almost nil (reversibility), the stability of the nervous system is practically nil, hence the degenerate is characterized by a dissolution of the laws of heredity and by an absence of mental stability.

This state of irreversibility of mental phenomena may affect an individual by changing (a) the personal psychical acquisitions from disturbance of the memory, of sensations (hallucinations) or associations (mental confusion), (b) the attitude of acquiring ideas and sensations (delicious interpretations), (c) the possibility of reversibility of mental phenomena causes affective disturbances to appear, either systematized — obsessions, or non-systematized — mania, melancholia, etc.

When, on the contrary, instead of being nil or average, the increase of entropy is very great, we then have those mental states susceptible of acquiring an extreme stability which characterizes the man of genius.

The difficulty to distinguish genius from degeneration is only apparent and arises from the fact that in both instances there is a dissolution of heredity, whose preservation is the apanage of banality.

Such are the conclusions derived from purely experimental notions of energy and entropy in place of metaphysical notions borrowed either from pure psychology or from automechanical theories.

NURSES FOR MENTAL DEFECTIVES

It has been fully recognized for some time that workers with the feebleminded require special training and preparation for their work. It is a self-evident fact that the nurse engaged in social work, in industrial or school nursing, or in public health work comes in contact almost daily with cases of subnormal or feebleminded children. The executive of the nursing divisions of institutions for mental defectives must have a very special knowledge of the causes, signs and symptoms, care and treatment, and education of such atypical cases. After the institution or the school has done all possible for such types of defectives, the most careful follow up and supervisory work is necessary so that these individuals may not be left to be a menace to the community.

According to a recent article on this subject by Mrs. Ann How, Superintendent of Nurses at the Children's Hospital on Randall's Island, the defective child will always be defective and the work of the special classes and other agencies can do no more than fit him for his place of limited range in the community. Yet it is a recognized fact that many of the higher grade defective children can be trained to be industrially efficient and selfsupporting, and can be made useful citizens of the community, provided proper supervision is supplied. Groups in various institutions have been trained through occupational therapy to do many kinds of handiwork, the returns from which enable them to contribute considerably to their own support. Other groups have been trained for efficient house service in the institutions caring for them, and some of these individuals are on the payroll and have started bank accounts of their own. To accomplish this, and to provide the proper supervisory care for its attainment, the head of the institution must have beyond all else vision and, contributory to this, the proper preparation and training as a background.

To prepare nurses for work which brings them in contact with mental defectives as outlined above, and to train executives for positions in institutions caring for the feebleminded, the New York City Children's Hospital and Schools at Randall's Island will offer a course of training to graduates from nursing schools of recognized standing. The initial classes will form October 1, 1923, and the course will be of three months' duration. Lectures will be given not only by heads of departments and instructors in the Randall's Island Schools, but by wellknown authorities on psychiatry and social work with mental defectives. The course will include practical work in the schools of the institution, in the psychological laboratory, and in the wards of the hospital. Certificates will be granted to nurses successfully completing the course.

Such a course will fill a real need in the community, and a wide response from professional nurses who wish to avail themselves of this opportunity for service of a most vital nature is anticipated.

SURGERY OF THE PERIPHERAL NERVES

At the Sixth Congress of the International Society of Surgery held in London, a short time ago, one morning session was given over to the reading of papers and discussion on the surgery of peripheral nerves. It need hardly be pointed out that the experiences of the war greatly enlarged the knowledge of the subject, and although the conditions of war cannot be applied by any means exactly to those of peace, yet it stands to reason that many, perhaps most, of the lessons learned in this branch of surgery during war will be valuable surgical acquirements in the time of peace. Some surgeons are inclined to lay too great stress on the difference of conditions. In industrial warfare as carried on under modern conditions nerve injuries are quite frequent.

Among the papers read at the Congress was one by the great French surgeon Professor A. Gosset, of Paris. He holds that the wounds of the nerves which should be operated on are (a) all the cases of progressive compression that grow worse and lead to the syndrome of serious irritation or interruption, (b) all the cases of complete interruption, clinically observed by competent neurologists after repeated examinations, and which show no sign of regeneration or show useless signs of regeneration like zones of limited stationary paresthesies and exhibit no sign of improvement, (c) for causalgia and serious neuritis, recourse should be had to an operation.

Professor Gosset indicates when to operate as follows: (a) The lessons of war surgery, which tended more and more to favor prompt operations, have shown us that we certainly have the right, even the duty, to examine during the preliminary surgical cleaning of the wound, the state of the important vessels and nerves. This is still more necessary, if, from the first day, there are signs of paralysis of a large nervous peripheric trunk. Any severed nerve should be, at once, stitched up so as to permit of rapid regeneration and thus, moreover, avoiding the deviation or the formation of sclerous tissue; in the case of a bruised nervous trunk, its preservation and constant observation seem to be preferable. (b) If some time has elapsed before the wounded subject has received medical attention, the diagnosticated lesion should be operated upon as quickly as possible, but nevertheless it is necessary to wait until the suppuration, the osteitis, and the inflammatory symptoms have disappeared for some weeks.

This is what Dr. Gosset advises should be done: (a) Simple liberation, with replacement between healthy muscles, is applicable to the syndromes of compression and of irritation. The enucleation of small intrafasicular fibroms should be practised only when it is without danger for the healthy nervous fascicles; the intranervous extraneous bodies should always be taken out. (b) Should the interruptions be examined several times, without any improvement being remarked, resection of the fibrous callus and neurilematic suture uniting two permeable ends, without traction at the level of the suture threads, should be practised. If the suture is impossible, a graft, or the dividing into two of the lower end, disguised graft should be practised. Useful results will be obtained only if the wounded subject has been kept without ankylosis, without muscular retraction, during the time preceding the surgical treatment. This treatment should not be given over too early, because experience has shown that it depends on the nerves themselves affected, on the suture or the graft, whether the period of regeneration may last from eighteen months to several years.

Dr. Gosset emphasizes that two cases should be distinctly distinguished. In war surgery, as well as in civil surgery, immediate suture of the nerves should normally be completely successful. Delayed surgical treatment may give good functional results in forty to fifty per cent. of the cases, according to the state of the nerves, when it has been performed from one month to two years after the injury was received. Even after that time it should be tried; it may be successful but Dr. Gosset agrees with most medical authorities that there is less chance of success. Nevertheless, the surgical treatment of the big nervous trunks is by no means illusory if it is carefully and systematically practised by specialists who are equipped for that purpose, and when the patient can be kept under prolonged observation. In these circumstances satisfactory results are possible.

Dr. Charles H. Frazier, of Philadelphia, discussed the results of three thousand gunshot wounds of the peripheral nerves treated in the reconstruction hospitals under the control of the Surgeon General's office, U. S. A. As regards the quality of recovery from resection and suture, according to Dr. Frazier's experience it is rarely perfect and the question of the bearing of the intraneural plexuses on this elicited. It is difficult to account for the high percentage of failures in certain nerves, external popiteal for instance. Neurolysis had failed in twenty-six per cent. of cases. Finally he thought that results had been sufficiently good to warrant the reexploration and suture if possible in cases of complete lesions of the median, ulnar, musculospiral and sciatic.

Mr. H. Platt, of Manchester, and Mr. W. R. Bristow, of London, contributed a joint paper in which they stated without reservation that the results of nerve suture had fallen short of expectations as was shown by an analysis of the true end results published for the first time by Professor J. B. Stopford. Also it was stated that many claims to success from grafting had been examined by the Medical Research Council and all had failed to convince. On the whole the impression left by the papers read and by the discussion which followed was that nerve surgery was not greatly successful, at least, war experience fostered such an opinion. However, it should be borne in mind that conditions in civil life are more favorable than during war, sepsis should be less frequent, and therefore better results should be expected. At any rate, the experience in this delicate and difficult branch of surgery gained in the war has taught a good deal which cannot but be valuable in civil conditions.

PAIN IN THE MIND

In a recent lecture on vaccination, Sir Almroth Wright declared that "emotional tension is intolerant of any intellectual *impasse*." He was describing in outline the steps by which modern medicine has progressed towards a clearer knowledge of disease and of the mechanism of the body's protection against disease.

Hypotheses are invariably tentative; of the best of them it may be said that, in a sense, they are made to be destroyed. Thus it was, to quote Sir Almroth again, the pain in the mind, which is felt when "one is appealed to and is powerless," which led Pasteur to revise his first theory of vaccination and so to achieve his great triumph over hydrophobia.

Last June, at St. Mary's Hospital, London, Professor Dreyer, of Oxford, offered still another extension of knowledge which is the outcome of revised opinions and changed ideas. His new treatment of tuberculosis, whether ultimately it stands or falls, is the last link in the chain extending back to Jenner. The chain is continuous, but its links if the metaphor may be extended, are not of the same shape nor even of the same metal.

Sir Almroth Wright has recently outlined his own revised opinions on the subject of vaccination against disease. These differ in many important respects from the views this pioneer held when he set himself to perfect the method of preventive inoculation against typhoid fever, which stood the world in so great stead during the years of the war. He no longer believes that our bodies elaborate a special and specific antidote against each germ that attacks them. Rather he takes the view that there is stored up in the while cells of the blood a common stock of antidote which may be released very swiftly and which is capable of inflicting death on most of our microbic foes. These are revolutionary opinions and it would be idle to pretend that at present they meet with general acceptance. Their importance, however, cannot be denied. Nor is it likely that the "pain in the mind" which gave them birth will suffer them to remain without the sustenance of continuous, experimental, proof. Vaccination is now fighting for first place among the weapons of cure and, thanks to such men as Wright and Dreyer, as well as many others possessed of the same temper of mind, it has literally forced itself on the world. Failure in more than one direction has already been changed into conspicuous success; no failure has been accepted as inevitable or irremediable: It may be that this urgent spirit is about to win its greatest triumph and that a new vista of hope is opening before us. In any case the future is pregnant with possibilities, inasmuch as many minds in the scientific world at this very moment are held in that "emotional tension" from which all progress and discovery emanates.

MENTAL CAUSES OF ACCIDENTS

A recent issue of the *National Safety News* contains an interesting article, with charts, by W. R. Woodbury, on mental factors in the prevention of industrial accidents and casualties. The chief mental causes of this type of accident emphasized are: 1, ignorance of the English language; 2, inexperience, including distractions, unfamiliar surroundings, and over anxiety and zeal on the part of beginners; 3, a curious mental limitation observable in some workers which seems to make it impossible for them to avoid accidents, and which they can rarely be trained out of; 4, sense defects; 5, faulty mental attitudes, such as fatalism, antagonism toward medical treatment, and timidity; 6, socalled mental sets—the chronic kicker, the grouch and the rabid radical are the victims of mental sets; 7, the tendency to extreme excitability, which may, however, be trained out of some workers; 8, unconscious errors, such, for instance, as those made when a worker is changed from a machine to which he has become accustomed to a new one of a slightly different type; 9, faulty habits, such as habitual carelessness and undue haste; 10, inattention and lack of interest in the work; 11, preoccupation, including worry, strife, mental disorder or depression; 12, sickness; 13, faulty plant conditions, such as dirt, poor lighting and ventilation, and impure drinking water; 14, fatigue, not necessarily the result of overwork, but of difficult living conditions, undernourishment, lack of sleep, worry or emotional stress.

RELIEF FOR EUROPEAN PHYSICIANS

New York, *September 24, 1923.*

To the Editor:

I wish to make this appeal to the American physician through the New York Medical Journal. You know of course that with the depreciation of currency the countries of Central and Eastern Europe have been pauperized. The people are no longer able to employ the services of physicians, and cannot pay for indispensable medical treatment. As a consequence, the medical profession is reduced to a state of starvation, and public health is being undermined. Over ninety per cent. of the people are being cared for by the Krankenkassen (state insurance) with the result that the doctor is paid less than two cents a call, if anything. Many doctors have been compelled to take up additional work in the mines, on street cars, etc., in order to earn enough to keep body and soul together; many, in desperation, have committed suicide.

Steps for the relief of this situation are imperative. This is the time for Americans to lend a helping hand to the starving physicians. A committee has been formed for this purpose and has organized the Association for the Relief of Needy Physicians of Central and Eastern Europe (Austria, Germany, Freestate of Danzig, Lithuania, Poland and Russia). The object of this society is to collect funds in the United States through subcommittees established in all the large cities and to use this money to support the medical profession abroad until they are again in a position to take care of themselves. The individual contributor is requested to designate the country to which his contribution shall be applied. Undesignated sums are to be divided by the Central Committee according to its best judgment.

Checks may be mailed to the treasurer, Mr. Henry C. Steneck, 265 Central Park West, New York City. We have no administrative expenses; all printing, stationery, clerical help, etc., is furnished free by the Steneck Trust Company, so that every cent collected is used for relief.

Very truly yours,
Max Einhorn, M. D., President.
20 East Sixty-third Street.

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News Items.

Neurologic Clinics Open.—The Neurological Institute, at 151 East Sixty-seventh Street, announces that they will open a night treatment clinic for men and another for women on Tuesday and Friday evenings at 7 p. m. The men's clinic will be open on Monday and Thursday evenings.

Dr. Elizabeth M. Gardiner Joins State Health Forces.—State Commissioner of Health Nicoll announces the appointment of Dr. Elizabeth M. Gardiner as associate director of the division of maternity, infancy, and child hygiene of his department. Dr. Gardiner has resigned the directorship of the child welfare division of the Rhode Island State Department of Health to join the health force.

Nansen Coming to Talk on League.—Dr. Fridtjof Nansen will visit the United States and Canada this winter, according to the League of Nations Society in Canada, under whose auspices he will make several addresses. Dr. Nansen is due to arrive in New York November 2nd.

Leidy Centenary.—Dr. William Darrach, dean of the medical faculty of Columbia University, will represent Columbia University at the celebration of the centenary of the birth of Joseph Leidy, the American naturalist. The meeting will be held in the Academy of Natural Sciences at Philadelphia on December 6th.

Health Day to Be Observed.—Announcement has been made that November 13th has been set aside as Health Day in the schools of New York City. On that day all regular work will be put aside and the time given to matters pertaining to health. Every teacher will examine her pupils, and send those she thinks need attention to the department of hygiene.

Dr. Carroll to Study Abroad.—Highland Hospital announces that its medical director, Dr. Robert S. Carroll, has been granted one year leave of absence for study and travel in Europe and the Orient. The directorship of the hospital will be carried on by Dr. Everett S. Barr, until recently the medical head of Philadelphia Hospital for Mental Diseases.

Dr. Wenyon to Succeed Balfour.—Dr. Andrew Balfour, C. B., C. M. G., F. R. C. P. E., for the past ten years chief director of the Wellcome Bureau of Scientific Research, London, resigns that position on October 31, 1923. He will be succeeded by Dr. C. M. Wenyon, C. M. G., C. B. E., M. B., B. Sc., who for the past nine years has been director of research in the tropics of the Wellcome Bureau of Scientific Research.

Medical Society Announcement.—Under the auspices of the Medical Society of the County of Kings the second fall term of talks entitled The Practical Lecture Series will open on Friday afternoon at 5 o'clock, October 5th, at the Library Building, 1313 Bedford Avenue. There will be ten lectures, each one of a practical nature and designed especially for the general practitioner. To date thirty lectures, of one hour's duration, have been given. These talks are part of a plan of free postgraduate medical education which is beginning its second term under the direction of joint committees of the Long Island College Hospital and the Medical Society of the County of Kings. Those interested in this matter may write to the dean of the Long Island College Hospital, Henry Street, Brooklyn, N. Y.

New York Postgraduate Medical School Announcement.—A course of lectures is announced by the Postgraduate Medical School and Hospital to be given on Friday afternoons at five o'clock during the coming season. These lectures will be free, and all members of the medical profession in New York City and vicinity are invited to attend. The following lectures are scheduled for next month: October 5th, The Treatment of Nephritis, by Dr. Arthur F. Chace; October 12th, A Diagnostic Clinic, by Dr. John F. Erdmann; October 19th, The Pathology and Prognosis of Eye Changes in Diabetes, by Dr. Max Cohen; October 26th, Uterine Hemorrhage—Its Significance and Treatment, by Dr. Henry Dawson Furniss.

Book Reviews

STAMMERING

No Need to Stammer; or, Reeducation of Speech for Stammering and Cleft Palate. By H. St. John Rumsey, M. A., with an introduction and chapter on Respiration by J. F. Halls Dally, M. A., M. D., B. C. New York: Dodd, Mead & Co., 1923.

The reading and study of this practical little book of only seventy-five pages should be of real help to persons suffering from the most common speech defects—stammering, socalled stuttering, and the difficulties arising from cleft palate. The book includes a nontechnical discussion of causes, a simple description of the vocal and respiratory mechanisms with their relation to proper methods of speaking, and exercises and directions for breaking the habit. The author believes that most stammering arises from careless habits or bad training in early life, but there are of course also cases that have an emotional basis, such as fright, shock, or sometimes an acute illness, as the causative factors. He emphasizes the great handicap of the stammerer and mentions one of his patients who declared that the shell fire in the trenches of France had never been able to frighten him so much as the opening of the door of his business office when he was alone, meaning that he might have to answer a question. As to the possibility of cure for the stammerer, the answer in every case the author says is, "Yes, if one has the patience and strength of character to follow sound advice and break down this distressing habit. The stammerer must have a real desire to overcome his trouble—he must have patience and determination in no small degree. Without these the best advice in the world will be wasted. On the other hand, if the patient is keen, willing and determined, the cure will be absolutely certain."

LAUGHTER

The Psychology of Laughter and Comedy. By J. Y. T. GRIEG, M.A. New York: Dodd, Mead and Company, 1923. Pp. 304.

Grieg has written a book excellent in form and of a subject matter old and yet new in his manner of presentation. His style is engaging as the reflection of a writer broad enough to challenge his reader to agree with him or to disagree, to laugh at his theories or to laugh with him, that is to find in them at least something which gives psychological phenomena another turn over in the interests of further enlightenment. Grieg keeps his own psychological position, whether in regard to laughter and comedy or other phenomena, free from dogmatic committal but is not afraid to state his beliefs and his train of psychological inquiry in sufficiently positive terms.

His viewpoint is genetic enough to lead him to investigate his subject first of all among children or rather infants. Here, a fairly close follower of Freud, he finds that the smile and then laughter appear as an accompaniment of the love instinct. The latter, "uncertain and illcoordinated" in its behavior, is subject to interruption through obstacles appearing in its way. Then the as sudden overcoming of this interruption leads to laughter. Hate lies close enough to love to give opportunity for laughter and comedy to find the pathway of hate as well as of love. Grieg finds it possible to trace all more complicated forms of laughter producing phenomena as but elaborations of this simple formula.

Grieg acknowledges his special indebtedness to Sully and Freud. He has examined the theories of both as well as of other writers upon the subject. He appends a summary of such writers down through the ages of literature. He also adds an extensive bibliography.

PSYCHOLOGY OF MIRACLES

Miracles and the New Psychology. A Study in the Healing Miracles of the New Testament. By E. R. MICKLEM, M.A., B.Litt. (Oxon). Oxford University Press, London: Humphrey Milford, 1922.

The author of this small volume need have made no excuse for adding to the many publications upon the socalled new psychology. He has carried the principles of it, in its various methods of therapeutic application, into a field of much psychological interest. He touches briefly upon theological and historical questions pertaining to the record of healing miracles of the New Testament but merely to dispose of these in a way to pursue the simple road of psychological explanation. In this task he feels his way questioningly rather than dogmatically. He himself lays special emphasis at the end upon faith in God without pursuing in regard to this the psychological factor of transference at which he has elsewhere hinted. But on the whole his work is an unprejudiced examination of possibilities of interpretation. It is a fair review of the various psychotherapeutic methods rooted in the new psychology. It also presents interesting material from the modern world, enlightened and superstitious, which he brings into comparison with the biblical situations. The book is presented in scholarly form and suggestively opens an interesting field for further study.

PSYCHOLOGY AND TEACHING

The New Psychology and the Teacher. By H. CRICHTON MILLER, M.A., M.D. New York: Thomas Seltzer, 1922. Pp. 225.

This is a book which gives many valuable suggestions of a sort to stimulate teachers and parents to a sense of their responsibilities to the needs of children as modern dynamic psychology realizes those needs. It sets forth in part the difficulties which are not ordinarily recognized as hindrances in the way of the child's development and points out the ways in which the psychology of the unconscious brings understanding and help in the face of the child's problems. There is, however, an incompleteness in all this, an incompleteness which carries the danger of imperfect direction because of the failure to penetrate sufficiently into the fundamental facts of the unconscious and to follow then their significance in the mental life. This failure is indeed a deliberate choice of the less adequate means of really analyzing the psychic life upheld by the author in his strong championship of Jung's conception of the unconscious. It reveals the idealism to which this tends at the expense of recognition of the basic facts upon which alone idealism could find a sure foundation. The author makes the familiar criticism that Freud's psychoanalysis has no such progressive goal and is unmindful of the individual's relation to the herd. All of which criticism reveals lack of comprehension of Freud's psychoanalysis and an unwillingness, conscious or otherwise, to search to the utmost among the things of the unconscious.

HYPNOTISM

Hypnotism and Suggestion. By Louis Satow. Translated by Bernard Miall. New York: Dodd, Mead and Company, 1923, pp. vii, 290.

This book should serve as a purifier of thought among readers of English as it is designed to be in its original tongue. The author has reviewed the history of hypnosis and suggestibility as these have been utilized popularly, religiously, pseudoscientifically and scientifically. He shows how the underlying principles upon which all such activity is built are reducible to scientifically definable terms. He inveighs courageously against the bondage to superstition and unthinking obedience to authority which characterizes man everywhere and at every age. He cries out against it as he points to its effect in producing wars and maintaining a belief in war. He shows the close psychological relation of this latter manifestation of "mass psychology" with other movements which have swept man into various forms of fanatic behavior. He shows also how the same psychic background out of which these things may arise is that which can be utilized for a sane and helpful therapy. In thus discussing the ground and the nature of hypnosis and suggestive treatment he has failed to penetrate into the determinative factors within the unconscious personality which make hypnosis possible, which are the very basis, indeed the very essence, of hypnosis and suggestion. He points in that direction with a forceful aiming at the truth that propels his reader into further questioning for himself. But he has not made sufficiently clear how the phenomena he discusses are rooted in the personality of the subject not injected from without. Why has Satow so consistently avoided all mention of psychoanalysis and its penetration of the unconscious? Why also when he states his preference for the term unconscious does he persist in using the term subconscious? He knocks at the door of the unconscious but goes away without investigating what is within. His translator, who has well rendered this valuable book, goes further with at least a psychoanalytical glossary appended to this English edition.

CHRISTIAN SCIENCE

Christian Science and the Catholic Faith. Including a Brief Account of New Thought and Other Modern Mental Healing Movements. By A. M. Bellwald, S.M., S.T.L. New York: The Macmillan Company, 1922. Pp. xvi, 269.

This study presents an example of lucid thinking, clear exposition, and broad psychological interpretation. These qualities make of the book a valuable contribution from the author's own hand, while they also present his material in a manner that reveals the rich psychological interest in the matter presented. The writer's review of mind cures through the past and the present is approached with understanding and his revelation of the dominantly egoistic personality of the founder of Christian Science is also a valuable psychological study. This may be said also of his interpretation of the hold of Christian Science upon its many adherents and of its therapeutic efficacy, real or falsely claimed. The writer stops at final acceptance of certain doctrines of his own faith when the way might have been more fruitfully left open for further keen investigation. He also manifests too little knowledge of some forms of mental therapy to dismiss them as lightly as he has done. Did he mean that Freud was actually "defunct" or only his system? Either belief would fade before a fuller examination of facts. These are indications of the way in which the stimulating thought of the writer leaves the reader only with regret that he has not permitted it all the freedom which it might have exercised.

TWINS

The Physiology of Twinning. By Horatio Hackett Newman. The University of Chicago Press, Chicago, Illinois.

Newman has presented a study upon the physiology of twinning to furnish fuller evidence to the theory set forth by him in his former study upon its biology. He has pursued the phenomenon of twinning through lower zoölogical forms and considered it with its possibilities in human embryology. He shows clearly that polyembryony must not be confused with true twinning. The latter is strictly a dichotomy due to a change in the axial gradient of development. When retardation occurs for one reason or another, the integration of the organism is weakened. Then the tendency for parts of such an organism to develop independently is manifest in the development of new axes which form the line of growth of two individuals where there was one. If an embryonic organism is divided into two equivalent regions each of these regions shows itself totipotent for complete development. Double monsters arise when the separation does not form equivalent halves, double organs if only special organs are involved. All these phenomena are therefore explicable upon this same gradient theory of twinning. Budding and transverse fission are not forms of the same phenomenon. The author therefore suggests a workable classification of the various modes of reproduction under the main divisions of axiate and nonaxiate reproduction. His theory excludes the consideration of twinning as a reversion to an ancestral condition.

PSYCHOLOGY OF OLD AGE

Psychologie et Développement de l'Enfance à la Vieillesse. By Ch. de Montet et H. Bersot. Ernest Bircher, Berne, Société Anonyme, 1922.

There is disappointingly little in this book although it contains a collection of observed facts in the growth of intellectual activity. They are viewed and interpreted along lines still too close to the older superficial psychology. Under the title one expects today richer gleanings in the field where intellectual growth is only one manifestation of a teeming psychic activity. A few hints that the mental life is such a whole are given but the full significance of such a fact seems to have escaped the authors of the book.

BRAIN AND SPINAL CORD

Kompendium der topischen Gehirn- und Ruckenmarksdiagnostik. Von Robert Bing. Funfte, vermehrte und verbesserte Auflage. Mit 102 zum Teil mehrfarbigen Abbildungen. Berlin and Wien: Urban & Schwarzenberg, 1922. Pp. viii-242.

Bing scarcely needs an introduction to American neurologists. This, his fifth edition, marks many minor and a few major additions to his standard manual on topical localization. Much of the material in this as well as his fourth edition has been gathered from findings during the Great War.

DISEASES OF THE LUNGS

Lehrbuch der Lungenkrankheiten. Von Dr. Adolf Backmeister. Mit 107 Textabbildungen und 4 teils farbigen Tafeln, Dritte neubearbeitete Auflage, Leipzig, 1923, Verlag von Georg Thieme.

This is one of the latest publications among the numerous textbooks on diseases of the lungs which have appeared of late by English, French, and German authors. Bacmeister, the author of this *Lehrbuch* (textbook), has the distinction of being not only an adjunct professor at a university, but at the same time the medical director of one of the largest and best known German sanatoria. In this volume of 350 pages, the greatest attention is, naturally, paid to pulmonary tuberculosis. It is gratifying to see the first chapter devoted to the anatomy and physiology of the lungs, for here matters receive attention which are usually omitted in the modern textbooks, such as, the chemistry of respiration, the relative pressure and mechanism of respiration, etc. It is surprising, however, that the author should include cough in this chapter, cough being a symptom that can hardly be considered as a physiological phenomenon.

The second chapter is devoted to the examination of the normal lung in the living adult. This chapter, while not offering anything new, is nevertheless interesting and instructive because of its numerous illustrations, which not only describe Kroenig's and Goldscheider's methods of percussion but give also several röntgen pictures of the normal lung.

Chapter III is devoted to the pathological changes which may accompany pulmonary diseases. An excellent illustration of club fingers in a case of bronchiectasis is given which should be a reminder to those who believe that this phenomenon is exclusively found in pulmonary tuberculosis; that in reality it is found in all chronic pulmonary diseases such as chronic emphysema, chronic pneumonia, and neoplasms of the lungs. The habitus phthisicus, emphysematous and paralytic thoraces are also well illustrated. Then comes a description of the well known auscultatory signs in these affections. Nothing new is offered in the discussion of the various frequent pulmonary infections not due to the tubercle bacillus. The author does not even mention serotherapy in connection with the treatment of whooping cough.

Chapter IV is devoted to trachites, bronchitis, and bronchopneumonia. The author pays a good deal more attention to inhalation therapy than we are accustomed to do in this country.

Chapters V, VI, and VII are devoted to the discussion of such affection as tracheal and bronchostenosis, and various types of pneumonia, pneumoconiosis, and lung abscesses. It is regrettable that in any discussion on pneumonia written in the year 1923, the admirable work of Cole and his associates at the Rockefeller Institute on the three types of the pneumonia cocci and the specific treatment of this disease, based on the character of these different types, should receive recognition and recommendation by but a few lines of reference. As a new specific remedy, the author recommends optochim (optochinum basicum five times daily, 0, 1-0, 2 in milk).

The ninth chapter is interesting because it treats of the rarer manifestations in lung pathology, such as edema, syphilis, actinomycosis, and neoplasms.

The rest of this volume is entirely devoted to pulmonary tuberculosis. Here the author gives his personal experience, which is interesting, but again nothing really new is offered. He speaks favorably of tuberculin; but admits freely that the greatest caution is necessary in its administration, particularly in the adult. He admits that he has seen disastrous results from the use of this remedy and now gives tuberculin only in early and slowly progressing cases. In this country we have long since been convinced of the uselessness of Friedmann's treatment of serum as a prophylactic and curative measure in tuberculosis; but Bacmeister devotes nearly a page in this new work to telling us that according to his experience, Friedmann's remedy has no curative or preventive effect on the disease and its use should be abandoned. Nevertheless, we have been informed that Friedmann received a professorship.

The complications in pulmonary tuberculosis, such as pleurisy, pneumothorax, etc., are briefly but intelligently treated. The chapter on artificial pneumothorax and surgical treatment is abundantly illustrated by röntgen pictures which makes its perusal particularly instructive.

The author of this work is to be congratulated on having been able to cover so vast a subject as all the known diseases of the lung in such an admirable, concise, and yet comprehensive way, and the students able to read medical German, will find Bacmeister's work an instructive and interesting addition to their libraries, and a book to be frequently consulted.

COLLECTED PAPERS

Clinics and Collected Papers of St. Elizabeth's Hospital, Richmond, Virginia. Volume of 1922. St. Louis: C. V. Mosby Company, 1923.

This book is the first of an annual issue of clinics and collected papers of St. Elizabeth's Hospital. The contributions consist of clinics and papers by members of the staff of St. Elizabeth's Hospital. The first three articles give a description of some of the administrative features of the hospital. The avowed purpose of the book is not alone to collect and record the papers that seem to be of some value, but to give clinical case reports that are interesting and which would not justify a full paper on the subject. A large number of the contributions are from the pen of Dr. J. Shelton Horsley covering his most important papers during the past six years. Dr. Warren T. Vaughan has contributed a number of clinics and papers on subjects of interest to internists. The clinic on allergic headache is of special interest. Dr. Fred M. Hodges has a number of papers on roentgenographic subjects. The illustrations by Helen Lorraine are uniformly good.

HEMATURIA

Die klinische Bedeutung der Hämaturie. Von Professor Dr. Hans Rubritius. Wien, Leipzig und München: Rikola Verlag, 1923. Pp. 34.

This little monograph is an excellent treatise on the clinical significance and the determination of the cause of hematuria. The differential diagnosis of the various disease pictures associated with hematuria in the male and female is discussed. It is of particular interest to the general practitioner.

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Medicoliterary Notes.

The Book of Good Health, dedicated to the Mohammedans of North Africa by the Pasteur Institute, is the title of a little book recently issued by the Pasteur Institute of Algiers to instruct the people to whom it is dedicated in the prevention of disease. It is purely hygienic, never medical, in treatment, and puts the rules of health in simple, picturesque language, adapted to the rank and file of readers of the Koran. Other countries would do well to follow the example in publishing for the masses so sane, simple, yet scientific a compendium of the classical rules of hygiene. The book is edited by Dr. Parrot and printed in Paris by the Imprimerie Nationale.

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Another foreign publication of significance is the new nursing journal entitled *L'Infirmière Française* (*The French Nurse*). Professor Calmette, founder of the dispensary in France and an enthusiastic supporter of public health nursing, is editor of the journal, and has a staff drawn from eminent French specialists. It is published by A. Poinat.

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An amusing article in the *New Republic* for August 29th is on Colyumism as a national trait. The writer is Mary Ellis Opdycke, a New York critic and journalist.

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Dr. Walter H. Brown, Director of Child Health Demonstration, Mansfield, Ohio, has an instructive article on the Trend of Maternal and Child Hygiene in the *American Journal of Public Health* for August. In the same number Dr. Dwight Lewis, of the Department of Health of New Haven, writes on the value of the sanitary index for the comparison of the health of different communities.

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The Hobo, by Nels Anderson, recently published by the University of Chicago Press, is a study of the American tramp from a broadly human and very honest point of view. It is probably the best book on the life and problems of the various kinds of vagabonds—hobos, bindle bums, home guards, punks, wolves, dinges, shovel stiffs, and gay cats are some of their designations—since Josiah Flynt's *Tramping with Tramps* was published.

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Statistics of Industrial Accidents in the United States, by Lucian W. Chaney, has recently been issued by the Bureau of Labor Statistics as Bulletin 339. The chief value of the report lies in the fact that it contains more information than has heretofore been collected on the various severity rates in the different industries and departments of industry. The severity rate is preferable to other methods of indicating hazard because its elements are more stable and uniform than others that might be chosen.

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An interesting study of the subconscious is Evelyn Scott's *Escapade.* It is a brilliantly written novel, the scene of which is laid in Brazil. The author herself characterizes the book as a creative autobiography.

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The Health Speaker's Handbook is the title of a valuable little pamphlet by Dr. Iago Galdston, recently issued by the New York Tuberculosis Association. It covers the subject of public speaking as a successful method of health education, giving suggestions on the use of slides, choice of material, duties of the chairman of meetings, and includes outlines of talks given before various types of audiences.

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The first stationary bath tub in the United States was built in Cincinnati and installed in a home there in 1842. It was denounced by the papers as an undemocratic luxury, and, stranger still, the medical men of that day declared it to be a menace to health. —*Northwestern Health Journal.*

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The *Illinois Institution Quarterly* for March contains the first annual report of the statistician of the Department of Public Welfare. It is a lengthy document, filling nearly 100 pages of the *Quarterly,* and containing many interesting tables, charts and maps.

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Leprosy has been found to be quite amenable to treatment, according to a recent report by the United States Public Health Service on conditions during the last ten years at the Kalihi Hospital on Molokai Island. A considerable percentage of the lepers segregated there have been paroled; that is, released as being "not a menace to the public health," but it has been required that they report for examination at stated intervals. The whole number paroled was 242; of these 31 had relapses, but 7 were paroled again, and 10 were completely released.

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The Columbus State Hospital, of Columbus, Ohio, is the oldest institution of the kind west of the Alleghenies, according to a letter written recently to the *Illinois Institution Quarterly* by its superintendent, Dr. William H. Pritchard. In 1835 the Ohio Legislature established an institution which became known as the Central Ohio Lunatic Asylum, and which received its first patients in 1838. Before that time the old Commercial Hospital in Cincinnati, founded in 1821, received mentally diseased persons from the whole State of Ohio.

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According to a recent report of the New York Census Committee, this city leads both Chicago and Philadelphia in its ratio of residents under twenty years of age, and also under thirty. The statistics showing this were tabulated by Dr. Walter Laidlaw.

Practical Therapeutics

ALCOHOLIC INJECTION OF THE GASSERIAN GANGLION FOR TIC DOULOUREUX*

By George M. Dorrance, M. D.,
and
J. William Bransfield, M. D.,
Philadelphia.

The use of alcoholic injections into the various divisions ot the fifth nerve for the relief of trigeminal neuralgia is an established procedure. The relief obtained varies from seven months to all times, dependent upon the infiltration obtained..

It is the injection of the ganglion itself that we are interested in and here a wide divergence of opinion exists both as to the rationale of the method and the length of time relief is obtained. We are inclined to believe that in the hands of an experienced operator, when a successful injection into the ganglion is made, the relief is permanent.

In 1911, Taptas, of Constantinople, made the first successful subcutaneous injection of alcohol into the ganglion while attempting to inject the third division although Sicard, in 1910, injected the ganglion after exposing the foramen. In 1916 we published an article on the Technic of Injecting the Gasserian Ganglion with Alcohol (1), and since that time we have been employing this method. We are still of the opinion expressed at that time that the operation advocated by Spiller and so successfully followed by Frazier is the ideal method in the hands of experts where a major operation is desired by the patient. We have had cases referred to us where socalled open operation was absolutely refused both by the patient and the family doctor and in these cases we have injected the ganglion with perfectly satisfactory results. Our earliest case is now of seven years' standing with complete relief of all pain and complete anesthesia in the area supplied by the fifth nerve.

The objections raised to the use of alcoholic injections into the ganglion have been based on the earliest cases done when the technic was not perfected and when operators with little skill or knowledge of the principles involved were using what was believed to be a simple procedure. The same training and skill are required to inject the ganglion with alcohol as to remove it. No one without practising faithfully on cadavers for a long period of time and without a thorough knowledge of the deep anatomy of the parts should attempt the injection.

Harvey Cushing is especially bitter in decrying alcoholic injections into the ganglion. He has never deliberately injected the ganglion but records cases he has seen where failures of various kinds occurred. He cites the danger of the lower jaw becoming locked from alcohol getting into the joint or muscles; middle ear diseases with sloughing of the parts due to alcohol being injected into the Eustacean tube; facial paralysis, and other complications. In practically all of the cases cited by Cushing, an error in technic occurred by the operator and like any other operation unsuccessfully performed, unfavorable sequelæ ensued.

We do not assert that alcoholic injection into the ganglion is free of all complications. None of a serious nature, however, has occurred in our cases. In no case was the patient dissatisfied with the minor complications which were more than compensated for by the complete absence of their pain.

The opinion among medical men, judging from the statements made in the literature and physicians referring cases to us and our hospital interns, is that the relief of pain from ganglionic injections is temporary, varying from nine months to one year. We wish to correct this erroneous impression. We have never had a recurrence of any of our cases where the ganglion was successfully injected.

Hartel, in 1920,. reports fifty cases with no recurrence, his earliest case in that year was of seven years' duration. Byrnes in the same year reports four recurrences in a series of thirty cases. His earliest case at that time was of six years' standing. One was six and a half years; another was seven years; and all were free from pain. The remaining three cases were less than two years' duration.

We are repeatedly asked if injection of the ganglion fails, will the major operation be rendered more difficult. Alcoholic injection does not interfere at all with subsequent operation.

We never advise an alcoholic injection into the ganglion without first explaining the advantages and disadvantages of the various types of treatment used for the relief of tic douloureux. We do not urge it in preference to the major operation in every case. The decision must rest with the patient.

In old people with high blood pressure, kidney disease, etc., we feel that alcoholic injection should be given preference over any other procedure. In bilateral trigeminal neuralgia with a negative Wassermann reaction, alcoholic injection offers more with less danger than the radical operation.

The technic which we employ is that devised by Hartel. Local anesthesia or in apprehensive, nervous cases, analgesia with nitrous oxide or chloroform is used. The patient is placed in the prone position with the head slightly elevated on a sand pillow. A stiff needle graded in centimetres, of a slightly larger calibre than the one used by Patrick, is employed. The guard on the needle is fixed at six cm. from the point. The left index finger feels in the buccal cavity through the closed narrow passage between the coronoid process and the tubercle maxillæ. The needle is introduced into the cheek about two and a half cm. from the angle of the mouth and two cm. below. With the guidance of the left index finger it is directed subcutaneously between the mandible and the tubercle maxillæ directly upward until it meets with the hard smooth resistance of the sphenoid bone. The finger may now be removed from the mouth. The needle at this time will be at a depth of four cm. Before any further manipulations are made, it is essential to keep in mind the fact that a line drawn vertically upwards from the point of entrance of the needle into the skin will bisect the pupil of the eye if looked at from in front while if looked at from the side it will bisect the articular eminence of the zygoma. The needle is now pushed backwards and slightly upwards; the operation becoming more painful as we approach the third branch. After several tentative feelings with the needle, the resistance suddenly ceases as we penetrate into the skull through the foramen avale.

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*Read before the Section on Medicine at the College of Physicians, Philadelphia.

We no longer feel any bony resistance, but instead what is quite characteristic on long practice, the elastic like resistance of the ganglionic tissue. The subjective symptoms of the patient vary greatly. Some suffer excruciating pain; others do not complain at all. In cases who have previously received extracranial injections of the third division, some difficulty is encountered because of the fibrous alterations around the foramen. The penetration of this scar tissue gives rise to pain and makes palpation along the bone more difficult. In these cases we depend exclusively upon the direction of the needle with its relation to the pupil and the articular tubercle. A trial novocaine injection using two per cent. solution will determine whether the ganglion has been reached. In about two minutes, if we are successful, analgesia occurs in the whole distribution of the trigeminus. If this action does not promptly follow, we are not in the ganglion, and experience alone will tell whether the injection should be repeated at a different depth or whether the needle should be withdrawn and the puncture done over.

In three of our cases dilatation of the pupil occurred with the injection of the novocaine. If our novocaine injection is successful, and the anesthesia is confined exclusively to the area supplied by the fifth nerve, we inject the alcohol. The alcohol should be injected drop by drop, close attention being paid to the eye movements of the patient and his subjective symptoms. The cannula is cautiously moved from side to side in order to inject as much of the ganglion as possible. A total of 2.5 c. c. of eighty-five per cent. pure alcohol is used. The cannula is rapidly withdrawn and the puncture wound painted with tincture of iodine.

The first few days following the injection, a careful record should be made of the extent of anesthesia obtained. If this area shrinks, i. e., if we find returning sensation, we can suspect that the ganglion has not been sufficiently infiltrated to give a permanent cure. These are the types of cases where the pain is likely to recur. At times this partial injection of the ganglion is indicated, but the patient must be warned that recurrence is more likely to occur.

COMPLICATIONS.

The most common complication is a hematoma of the cheek. This yields rapidly to cold compress treatment. Paralytic keratitis has occurred in about fifteen per cent. of the cases reported. We have had one ulcer of the eye which healed up under treatment leaving a slight scar. Septic meningitis has been reported by Hartel in one case. We have never seen this. The complications objected to by most men in criticizing the alcoholic injection are not due to the ganglion being infiltrated but are due to the alcohol being injected elsewhere.

We regret to report the loss of one eye, a year after the alcoholic injection. On account of the anesthesia of the cornea, the patient had been instructed to flush the eye daily with warm boric acid solution. She mistook spirits of ammonia for her boric acid solution and flushed the eye causing the deplorable result noted.

If proper care is taken to observe the effects of the trial novocaine injection, most of the untoward results reported will not occur, e. g., if ocular motor palsy follows the novocaine; if pain occurs in the ear; if the anesthesia is not complete in the distribution of the trigeminus, no alcohol is injected at this time and the position of the needle is altered or withdrawn and the puncture repeated when the effect of the novocaine has worn off.

Our attention has been called to the paralysis of the motor root following the injection of alcohol and devices have been suggested by A. Bleichsteiner, of Vienna, to overcome the deviation of the jaw caused by the paralysis. We have only seen one case with motor palsy after six months. As a general rule, motor paralysis clears up before the eighth month. Patients are unaware that it exists and it causes no inconvenience. Little or no atrophy of the muscles of mastication has been observed.

We are at the present time engaged in some experimental work on dogs, exposing the foramen ovale and injecting the ganglion with alcohol, in order to study the late effects of alcohol infiltrated into the ganglion. We are not as yet ready to report on these but are inclined to agree with the reports of Otto May, of London, and Charles Byrnes, of Baltimore. Degeneration of the ganglionic cells with fragmentation and disintegration of the nerve fibres of the spinal root occur in all cases. We agree with them that one injection of alcohol will not destroy the ganglion but it appears to cause, in a successful injection, chemical divisions of the sensory root.

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2025 Walnut Street.

FRIEDLANDER BACILLUS MENINGITIS

By Harold W. Jones, M. D.,
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and
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The number of cases of Friedlander bacillus meningitis in medical literature is less than ten. As a matter of interest and because of its rarity, we make the following case report.

Case.—J. C., male, aged fifty-two, laborer, was admitted to the Philadelphia General Hospital, delirious and complaining chiefly of a severe headache. The history obtained from a friend, was that, five days previously, he had complained of a slight headache which increased in severity on the fifth day he had noticed that the patient was disoriented and showed marked incoherence of speech. As far as he knew the man had never been seriously ill but had always been a heavy drinker of intoxicating liquor. On admission to the medical ward the patient was combative, delirious, but not particularly oisy. The physical findings were as follows: Robust adult male, with slight cyanosis and no yspnea. Neck resisted flexion on chest. Some cervical ophthisthotonus was present. Nose and ears ormal, throat injected but no exudate present. Bilateral ptosis of lids, pupils dilated but mobile, eyes otherwise negative. The lungs were negative except for slight signs of moisture at the bases. The heart was regular, rapid; no enlargement or murmurs found. The abdomen showed a slight rigidity of the recti muscles. The extremities were negative xcept for isolated muscular twitchings.

The neurological findings showed: stiff neck, Kernig sign strongly positive in both legs, Brudzinski ign positive, Babinski sign positive in right foot, nd the Gordon sign positive.

The laboratory findings showed: Spinal fluid—urbid and under marked pressure, loaded with cells, 94 per cent. polynuclear, 6 per cent. mononuclear. The smear showed a gram negative extracellular bacillus (some with fatty capsule) four to five to he field. No meningococci were found. A culture showed typical Friedlander bacillus growth from four distinct specimens.

The blood: White blood cells 21,000, polymorphonuclear 90 per cent., small lymphocytes 8 per cent., large mononuclears 2 per cent., a culture was negative.

COURSE AND TREATMENT.

One hour after admission, forty c. c. of spinal fluid were withdrawn and thirty c. c. of antimeningococcus serum injected by gravity. The temperature was 103° F, pulse 125, respiration 28. Following the use of serum he was slightly improved. The next morning the fluid was again withdrawn and serum injected. Several hours later a cisterna puncture was made by Dr. Franklin Ebaugh and serum introduced. The pressure of the spinal fluid here was much greater than that withdrawn at Quincke's space.

At four p. m. that same day the patient became more comatose and showed marked cyanosis. The temperature was 105° F, pulse 160, respiration 40. He died at 8:15 p. m.

Unfortunately a postmortem was refused by the friends. We are indebted to Dr. Ross V. Patterson for the privilege of reporting this case.

1805 PINE STREET.

A CASE OF MENINGOCOCCUS MENINGITIS DIAGNOSIS BY MEANS OF COMPLEMENT FIXATION

By CHARLES H. NAMMACK, A. B., M. D.,
New York,
Captain, M. R. C., U. S. A.; Assistant Visiting Physician Bellevue Hospital, Instructor in Medicine Cornell University.

The following case is deemed worthy of report because it was a case of meningitis presenting unusual features and in which the usual methods of laboratory diagnosis failed and the diagnosis was only arrived at late in the disease by means of complement fixation tests on the blood and spinal fluid of the patient.

CASE.—The patient was admitted to the wards of the Fourth Medical Division of Bellevue Hospital on December 21, 1921, from the psychiatric wards, complaining of pains in the chest and fever. She was single, aged thirty-eight and a cook by occupation. The onset had come three weeks prior to admission with severe frontal headache. For a week before admission she had been vomiting. In order to relieve her subjective symptoms she imbibed considerable quantities of whiskey a beverage to which she was not unaccustomed both for medicinal and social purposes. It failed to relieve her and because of the resulting mental confusion she was admitted to the observation ward at Bellevue.

Her examination, including eyegrounds, ears and pelvis was negative except for furred tongue, flushed face, and slow pulse as compared to temperature 90° to 102° F. She was constipated. In spite of the absence of splenic enlargement or rose spots a provisional diagnosis of typhoid was made and blood culture and Widal were taken. On the 22nd and 23rd her temperature reached 104°, blood culture and Widals were negative, white blood cells 7,700, polymorphonuclears 78 per cent. hemoglobin 85 per cent.

Her condition remained the same for five days with elevated temperature and disorientation of a mild delirium. On the 28th it was observed that her neck was rigid with double Kernig. Lumbar puncture yielded cloudy fluid under pressure, 1200 cells 96 per cent. lymphocytes, 4 per cent. polymorphonuclears, no organisms by smear or culture, globulin two plus, no reduction of Fehling's. The gold chloride curve at this time was all zeros which was probably a technical error.

Spinal tap on the 30th showed 500 cells, globulin 2 plus, Fehling's negative, no organisms. Two diagnoses were considered at this time—encephalitis and tuberculous meningitis, with the latter as almost certain because of the absence of sugar from the spinal fluid. The Wassermann on both blood and spinal fluid were negative and there was no cranial nerve palsies so cerebrospinal lues was not considered. On January 2nd the spinal fluid was clear, no increase in pressure 256 cells 90 per cent. lymphocytes, globulin 1 plus, albumen 2 plus, Fehling's 0. No organisms present.

On the 3rd she was seen by the consultant from the neurological service who thought the case was one of meningism in association with a toxic condition most probably an alcoholic wet brain. The lumbar puncture done on January 5th showed clear fluid under pressure, 160 cells, 100 lymphocytes, globulin 1 plus, no reduction of Fehling's. The patient showed improvement, there was less rigidity and the temperature was lower. On January 9th lumbar puncture was again performed and yielded clear fluid without increased pressure, 96 cells, albumen 2 plus, globulin 1 plus, Fehling's 2 plus—the return of the reduction—and no organisms.

At this date the case was seen by Dr. Josephine B. Neal, Chief of the Meningitis Division, N. Y. Department of Health, who suggested the possibility of the case being a mild one of epidemic cerebrospinal meningitis. The blood and spinal fluid were accordingly tested for meningococcus fixation by Miss May Wilson in the Department Laboratory at Bellevue. The former yielded a strongly positive and the spinal fluid a weakly positive reaction. The agglutination tests were negative. The temperature reached normal on January 12th and a lumbar puncture done on this date yielded clear fluid, 103 cells, albumen 1 plus, globulin 1 plus, Fehling's 2 plus, gold curve 01122210000. From this time on the patient became steadily better and was discharged on February 21, 1922, as a cured case of cerebrospinal meningitis.

The unique features of the case were the late onset of meningeal symptoms and signs, the recovery under treatment which consisted only of repeated lumbar punctures without any serum therapy, and the making of a final and correct diagnosis without bacteriological evidence by means of complement fixation tests done on the blood and spinal fluid late in the course of the disease.

130 East Fifty-sixth Street.

Artificial Pneumothorax.—J. J. Perkins and L. S. T. Burrell (*Lancet,* March 10, 1923) show that artificial pneumothorax may be of value in conditions other than pulmonary tuberculosis, such as abscess of the lung, bronchiectasis, hemoptysis of unknown origin, and recurrent pleural effusion. In abscess of the lung the success of this procedure evidently depends upon the presence or absence of adhesions; where these are absent artificial pneumothorax is sufficient to effect a cure and render a more severe operation unnecessary. Considering the uncertainty of discovering the abscess cavity it is certainly to be preferred to drainage. When the abscess is superficial the presence of adhesions may lead under pneumothorax to its intrapleural rupture, necessitating drainage of the pleura. If the adhesions are widespread they may stand in the way of complete collapse and prevent success, necessitating thoracoplasty. But even so the authors advocate artificial pneumothorax as routine procedure, on the ground that it may be sufficient in itself and, where not, that the symptoms are relieved and the general condition of the patient improved, enabling him better to face the severer operation. Success in bronchiectasis depends on adhesions as it does in abscess of the lung.

Treatment of Typhoid Fever.—George S. Bel (*New Orleans Medical and Surgical Journal,* April, 1923) summarizes the treatment of the typhoid patient under the heads of general management, diet, hydrotherapy, chemotherapy, vaccine and serum therapy, and the treatment of special symptoms. General management includes a well ventilated room with good light, an efficient nurse, a comfortable bed, and a blood examination repeated every few days. The diet should be liberal, of easily assimilated foods. In selecting a diet one must remember. 1. That the carbohydrates, such as gruels, oatmeal, cream of wheat, hominy, crackers, bread, toast, mashed and baked potatoes, milk, sugar or lactose, should furnish half or more of the calories and lessen nitrogenous waste. 2. That protein destruction in typhoid fever is very high and can be avoided to a great extent by an average amount of sixty or seventy grams of protein in the diet. The proteins are supplied by milk, cream, eggs, beef juices, etc. Fats have a high caloric value and are of material aid, being mostly supplied by cream, butter and cocoa. 3. That vitamines are important. Here again milk is essential as it contains both water soluble B and fat soluble A vitamines; orange juice, lemon juice, tomato juice and other vegetable juices are beneficial. The diet should be varied daily and the food selected for each individual patient. Water should be given freely at definite intervals and in large amounts. Plain water is preferable to albumin water or lemonade. Hydrotherapy is the only logical febrifuge and affords the best means to reduce and control the temperature and to prevent the development of severe nervous symptoms. Whenever practicable the cold bath is always preferable, and the sooner it is instituted the better. A tub of sufficient length and width should be placed beside the bed and filled to three fourths of its depth with water at 85° F. in order to cover the patient up to the neck; the head should be supported by a rubber air pillow attached to the edge of the tub, and a rubber air cushion beneath the buttocks will make the patient more comfortable. The night shirt is removed, the patient covered with a sheet under which he is to be bathed, a stimulant, such as brandy, whiskey, or strong black coffee is administered, the body is wiped dry if perspiring, and a bit of cotton is placed in each ear. Then he is gently transferred to the bath by two attendants, one grasping him under the shoulder, resting his head on the attendant's arm, the other just below the knees, while the patient is asked to stiffen out. As soon as the patient is in the tub brisk friction should be applied to the whole body except the abdomen. Cold compresses, frequently changed, should be placed on the forehead. The bed should be prepared for his return by placing on it a double blanket and over this a warm, dry sheet, with hot water bottles at the foot. The patient is lifted from the tub into the bed, the warm, dry sheet folded over him, a fold being passed between each arm and the side of the body and between the legs so the skin surfaces shall not come in contact, and thoroughly dried by being rubbed over the sheet and the blanket then wrapped about him. At the end of ten minutes he is taken out of the sheet, rubbed dry, gown and bed clothing replaced. When this method cannot be employed the wet pack may be used, or when this also is impracticable, the entire body, except the abdomen, may be rubbed briskly with cold water. Drugs are of little value in uncomplicated cases. Massage of the lower limbs during the course of the fever renders the patients capable of walking earlier than usual. Vaccine and serum therapy, while theoretically correct, has not yet proved of practical value. Special symptoms: Thorough evacuation of the bowels early in the course, best with castor oil. Then a daily evacuation by means of enemata or mineral oil if necessary. Diarrhea and tympanites can usually be overcome by regulating the diet, withdrawing sugars, cream, fruit juices, jellies. If this fails recourse is had to usual methods. When hemorrhage occurs the first essential is absolute rest and withdrawal of all food. Perforation demands immediate operative intervention, if possible under local anesthesia. The patient should not be allowed to sit up in bed until he has been free from fever from three to five days.

Proceedings of Societies

NEW YORK NEUROLOGICAL SOCIETY

Four Hundred and Fifth Regular Meeting, Held on May 1, 1923.

Dr. E. G. Zabriskie, president, in the chair.

ADDRESS OF EDWIN G. ZABRISKIE, M. D., PRESIDENT ELECT OF THE SOCIETY.

In this present day world of constant endeavor to ncrease efficiency in all direction, but chiefly along he lines of production, we at all times encounter the efforts of the medical profession to contribute their share in this work, not only by improving the health of the individual, but also by preventing disease states. That we as neurologists and psychiatrists come in for a heavy share in the responsibility of preventive medicine cannot be doubted if one stops o consider that today there are 250,000 patients in hospitals for mental diseases in this country; that 0,000 are admitted to these hospitals annually; that he cost of maintenance for those suffering from mental diseases is about $75,000,000 each year, while he economic loss to the United States each year on account of mental diseases is over $200,000,000.

Before the war our most intensive thought was applied chiefly to the problems of prophylaxis, treatment and custodial care of the insane, the feebleminded, the delinquent and the criminal. Years of patient effort had succeeded in enlisting the sympathetic cooperation of public minded men of diverse occupations and intellectual training, for the purpose of attacking these problems, because of the social economic wastage they represented. A comprehensive program for intensive study of the situation throughout the country was inaugurated by the National Committee and gratifying results had already been obtained. The entry of the United States into the war, however, interrupted this program temporarily, but its loss was more than offset by giving us a magnificent opportunity to arouse the attention of the community at large to the great numbers of young men eliminated during our hurried assembling of soldiers, because of pathological constitutions or temperamental instability as well as organic nervous disorders, which rendered them unfit for military service. We are now beginning to profit by this lesson, for we realize as never before the almost staggering proportion of unstable persons in this country, many of whom never reach custodial care, but who nevertheless represent a tremendous decrease of steady production, who at least in episodic reactions are potentially insane or are potential criminals. These facts have been accorded due significance in the economic and etiologic problems of neuropsychiatry and are furnishing a still greater stimulus for the prevention of disease.

One might say that it was hardly necessary to formulate so obvious a truism, that the proper place to begin the investigation of the preventive side of the problem is during childhood, since science teaches us to search the very beginning of all morbid processes for their causes. This has long been the practice in the study of insanity and of criminology, especially since we have undertaken the investigation of personality makeup, as a glance at the treatises on mental diseases and the studies in juvenile delinquency and truancy will confirm. But now an imperative demand for a more searching investigation of the milder conduct disorders and maladjustments of childhood, the nervous child with tics, speech defects and other evidences of instability becomes manifest, and today we see an extensive movement under way in many widely separated parts of this country, which embraces the study and treatment of all functional nervous disorders of childhood, and covers a field, the limits and possibilities of which are almost boundless. Problem clinics, mental hygiene clinics for children, school clinics, clinics connected with the courts are springing into existence from coast to coast, and we can foresee the foundations laid for a composite picture of the abnormal individual from childhood on, which will perforce include the anthropomorphic, physiological, personality and emotional makeup, the environment and all other factors which might influence the development of the individual.

Even some of the psychologists are beginning to recognize that other factors than intelligence quotients are necessary for the complete understanding of the person. Thus in 1914 Wallin suggested that, "Just as soon as a child shows evidence of abnormality, incorrigibility, etc., he should be examined by a psychoeducational clinic which should also afford a medical, hereditary and sociological examination."

The schools furnish a wonderful opportunity for study of these abnormalities either by the group method or individually. The observations of A. J. Pillsbury that ninety per cent. of criminals begin their careers as truants, show what a wealth of material we have practically at our door. On a conservative estimate, from two to four per cent. of retarded children in the schools are idiots, imbeciles, morons, border cases, epileptics, neurotics and psychoneurotics. From fifteen to thirty per cent. grade all the way from border line or seriously backward to merely dull or slow progress pupils. Fully one third are pedagogically retarded when measured by age-grade standard, and about two per cent. suffer from some form of speech defect. As there are approximately 6,000,000 pupils in the United States the full significance of these figures becomes apparent to those of us who participated in the army eliminations.

Someone has said that one of the most striking if not the most important lesson of the great war was that temperamentally the human race had not changed in any essential feature since the very earliest times. There is much evidence to support the statement and truly we seem to find the same savagery, wanton destruction, wholesale discarding of personal responsibility, mass hysteria among soldiers and civilians alike, that characterized all former conflicts. Furthermore, each nation displayed the emotional reactions that had characterized it since its inception or in other words ran true to its national form. If the above statement contains the elements of truth as I surely believe it does, one must turn for its explanation to that elusive combination of so-called primitive instincts, unconscious strivings, inhibitions, impulses, moods and emotional traits that contrive to form what we are pleased to call personality, character or individual makeup. Although long ago Herbert Spencer uttered his belief that the whole of life is an adjustment, a continuous adjustment of inner to outer relations, it is only within relatively recent times that sociologist, psychologist and psychiatrist have turned from the study of groups and their classifications to intensive work on the individual and his reaction to environment. Thanks to the illuminating and clarifying studies of Hoch, Freud, Janet, Bleuler and others, we now have at least a working method of approach to the problems of personality makeup, although it is not the purpose of these remarks to do more than point out some of the current ideas. To be sure they are chiefly founded on behavioristic reactions, at least from the viewpoint of MacDougall, who, as the late lamented Southard puts it, has begun to study man's inner relations as they touch society and from the viewpoint of the sociologists who are endeavoring to carry society back to certain springs of action in the individual mind. To the MacDougall school character is the result of habit formation or instincts which are amenable to selfcontrol and selfdetermination. The psychoanalists, while dealing chiefly with psychopathology, look at personality in terms of sex determinism, conflicts, sublimations, repressions, unconscious strivings, organ representation and the like.

A glance at the most recently compiled endocrine charts will show that a definite place is accorded emotional traits, psychic variability and sexual characteristics, whether they be inversions, heterosexual or hermaphroditic features. Some of the more fanciful of this group of specialists have gone the length of constructing personality types; thus we have the pituitary type who is aggressive, precocious, calculating, selfcontained, the pituitary inferior mentally dull, apathetic, sluggish, poor self control, emotionally unstable, easily discouraged. The hyperthyroid: restless, talkative, liable to anxiety states and vasomotor instability. The hypothyroid: dull, apathetic, prone to all grades of depression, thymic. The morally irresponsible with a tendency to drug addiction, homosexual practice, suicide. The gonodal: introverted, shutin, sex and emotional infantilism or the eunuchoid state.

One even attempts to link the fundamental instincts with the internal secretions; thus we read that the two most important instincts which in the complexity of their sublimations have created most of the institutions of society: the maternal (social and creative), and intellectual curiosity (constructive and acquisitive tendencies) are connected with proper function of the pituitary.

In closest relation to the thyroid are the instincts called, by MacDougall, selfdisplay and selfeffacement, exaltation, boasting, exhibitionism or depression, selfreproach, etc. Thyroid activity is also expressed in sensitivity, i. e., the ability to discriminate between different grades of sensation and energy. If poor memory goes with the kind of thyroid inactivity seen in cretins, we may deduce that good memory thyroid is associated with inactivity; it works by increasing the conductivity of the brain.

At all events we are entering a period of research in childhood which should constitute the most extensive biological laboratory experiment the world has ever seen. It will need many years of painstaking, patient collecting of data before the results can be known and unfortunately most of us present will have passed on without more than a conjecture of what they will be.

At a small gathering not long ago it was my privilege to listen to a highly diverting semihumorous outline of plans for the establishment of a parentorium, i. e., an institution controlled by the state to which parents having difficulty in the management of their children could be committed. The basic idea of the scheme was a reformatory one which had in view the inculcation of a proper sympathetic insight into the real difficulties of childhood. Fantastic as the idea may seem, it nevertheless strikes deeply at the root of so many conduct disorders in childhood, as anyone familiar with mental hygiene literature must know. The instance of a mother's despair over the incorrigibility of her little girl, when she herself made promises of candy, clothes, etc., as inducements to secure necessary trips to the doctor or dentist or something equally unpleasant, but with no intent of fulfilling such promises, and allowed the child to see her pilfer money from her sleeping husband's clothes is by no means uncommon. Locking a six year old child in a dark closet for half an hour is no way to cure him of his fear of the dark, nor is the practice of holding the thumb of a four year old baby against a hot stove a safe method of correcting thumb sucking. The literature on delinquents likewise abounds with comments on unintelligent handling of children through lack of proper insight, example or energetic measures sufficient to adequately carry out recommendations made by competent persons. Frequently the home environment is frankly impossible either through sheer physical inability on the part of one or both parents due to malnutrition or some bodily disorder to cope with the problem. On the other hand they may be frank neurotics, psychoneurotics, psychopaths of one sort or another who are thereby not only totally inadequate to handle the situation, but on the contrary they are often the most important factors in the creation of these situations. Imagine for instance the possibilities for the production of unhealthy traits in a little girl of eight years whose home life is the constant scene of quarrels between a father who is aggressive, easy going, possesses no ideas of discipline, and accedes constantly for the sake of peace and quiet to the whims of a mother who is profoundly egocentric, headstrong, a day dreamer, hypersensitive and periodically addicted to morphine.

Subdural Effusion and Hydrocephalus.—Dr. Wilder G. Penfield, (by invitation), presented a case of a little boy with increased intracranial pressure after otitis media. This had progressed to blindness on admission to the Presbyterian Hospital. By means of cranial pneumograms, pressure determinations and chemical and cystological study of the fluids, it was determined that there had been an effusion of fluid into the subdural space and that perhaps secondary to this, there was a moderate degree of ventricular dilatation. As a result of successive dural punctures the vision returned to a large extent and the other evidences of cerebral compression disappeared. The speaker suggested hat subdural effusion would explain the not infreuent association of otitis media with papiledema.

Dr. C. A. Elsberg discussing the case presented y Dr. Penfield said it was interesting and rare. ubdural effusions were rare excepting after trauma, nd an effusion as a result of an inflammatory process was very rare indeed. The x rays presented by Dr. Penfield showed the extent of the subdural effuion and that the ventricular system was open.

The case is also very interesting from the viewpoint of the blindness. For years I have been telling he students that, if an individual is blind from apilledema, the vision can never be restored. I ave tried to save some vision by early operation, nywhere from four to twenty-four hours after the complete loss of vision had occurred, but was never ble to save the patient's eyesight. Recently, howver, I had a patient who was entirely blind from papilledema but in whom considerable vision returned after removal of fluid by ventricular puncure. Dr. Penfield's case is another one of this ind. Dr. Penfield's case shows also how much inormation can be obtained from a careful study of he x ray plates after air injections.

Dr. I. Abrahamson said that it was very likely hat in this case the blindness was due not to the apilledema, but to collections of fluid covering and ffecting both calcarine areas. The child appeared o have hemianopsia at the present time.

Dr. W. G. Penfield (in closing) had nothing to dd except that it is very difficult to be sure whether r not any hemianopsia is present in a child of this ge. His mother has noticed that he holds objects up to one eye for inspection in preference to the other. The corresponding optic disc is less pale than hat on the other side. I have assumed that this xplains his movements rather than any hemianopsia.

Work of Demonstration Clinics Conducted by Division on Prevention of Delinquency of Naional Committee for Mental Hygiene.—Dr. V. V. Anderson, of New York (by invitation), said that more than half of the children that passed through he juvenile court showed physical and mental disabilities that are fundamental factors in their delinquent conduct. The disposition of their cases, without an adequate knowledge of the social implications of those conditions, merely invites failure so far as he adjustment of the child is concerned. Certainly ntelligent treatment without such knowledge is impossible. While a certain percentage of the children presents serious problems, the great majority of them are not to be thought of in terms of the usual medical classifications but as examples of childhood difficulies that have their origin in the home, the school, or other situations in which parents, brothers and sisters, teachers and playmates have an important part.

In the particular conduct of the child we will find the rôle his personality plays in adjusting itself to ife's situations. This view of behavior has a personality reaction in the effort of the child to adjust himself to his environment, by no means excludes consideration of the values to be attached to serious constitutional conditions both inherited and acquired. The importance, however, of feeblemindedness and grossly abnormal mental conditions is not such as we were led to believe from earlier investigations.

Real progress will be made through a better understanding of the children's personality and the influences from within and without that mould it and make it what it is. Our studies have shown that practically all of the delinquent children that pass through the juvenile courts are also public school problems. Effective preventive work means the application of more scientific measures in understanding and solving the problems of the children before they get into court, while they are in the school and at home.

Dr. Thomas H. Haines said that these systematic demonstration clinics which the Division on the Prevention of Delinquency of the National Committee for Mental Hygiene is stationing in various cities, he regards as outposts for the demonstration of what the social engineer and the psychiatrist can do in the study of the problems of many unfortunate boys and girls.

Miss Elizabeth Farrell remarked that the type of work described by Dr. Anderson, with modifications that we know to be desirable, has been carried on by the Board of Education of this city for the past twelve years.

Dr. L. Pierce Clark fully approves of Dr. Anderson's work in all its bearings. Beyond the immediate practical value of Dr. Anderson's results is the highly important effort to solve what may be done to modify human nature either in its inherited or acquired pattern. This larger problem is usually embraced under what we designate as personality, while character is the term that perhaps may be limited to the uses to which this innate personality is put in the process of life adaptations. Personality perhaps may not be changed, or only so slightly as to be negligible, while character lies at the very core of our social adjustment and may be signally changed with the beneficient results which Dr. Anderson has already reported.

Dr. Sanger Brown spoke of some other interesting studies which Miss Theis, of the State Charities Aid Association of New York, has been making. She has records of about 950 children who have been placed out in homes by that society. Miss Theis's findings indicate that despite their bad or uncertain heredity these children are not very different from children from normal homes. Many of them have now reached the age of eighteen years and over. There is not a high percentage of insanity among them; there is not a high percentage of mental defect, and there are not many delinquents in the group. This is a hopeful aspect of this whole problem of child welfare in the case of dependent and neglected children.

Dr. S. R. Leahy mentioned the fact that 1,600 children were surveyed at the Protectory last summer, according to intellectual percentage; eighty-five per cent. were of average intellect, about five per cent. were subnormal, and the rest of the group superior. He also found that third offenders were all practically four years or more back in grades. He stated that Miss Farrell is correct and that school is the first adaptation. The child is forced to meet others outside the family. Here he feels that there are other children who have rights. If he is successfully placed here, it will be a real prevention of further defects.

Abstracts from Current Literature

NEUROLOGY.

The Present State of Experimental Research in Herpes and Encephalitis. — Ernst Lauda (*Wiener klinische Wochenschrift,* March 29, 1923) finds that febrile herpes and herpes of the genitals and of the cornea have the same etiology, which is a uniform, living, filterable virus. Different authors have been enabled to cultivate easily viruses from patients with encephalitis, which showed the same characteristics in animal experiments and immunologically as the virus of febrile herpes, with which they apparently are identical or closely related. The theory of their identity of Doerr and Schnabel, which is based upon this fact, does not seem to have been contradicted up to this time. The author's own investigations point in favor of this theory of identity, insofar as the same general symptoms were observed in rabbits after inoculation with the herpetic and encephalitic inoculation and insofar as it was demonstrable that the changes in the brain of rabbits are also identical.

The Relationship of Epidemic Encephalitis to Herpes Febrilis and to Influenza.—As a result of a series of experiments, R. Doerr and W. Berger (*Schweizer medizinische Wochenschrift,* August 31, 1922) arrived at the following conclusions: 1. Two new strains of encephalitic virus (Basel II and Basel III) could be isolated by subdural inoculation of the brain emulsion in rabbits from the brains of two clinically and pathologicoanatomically diagnosed cases of epidemic encephalitis (lethargic). 2. These reacted in a typical manner on the cornea and the central nervous system of the experimental animals. 3. One of the strains was used for experiments in crossed immunity with the virus of herpes febrilis, with the result that the similar immunizing powers of encephalitis and herpes febrilis were demonstrable. 4. The encephalitic virus was not demonstrable in the blood of uncomplicated cases of influenza, following its reinoculation into the rabbit's cornea, either in the beginning of the disease or at the height.

A Cerebrospinal Fluid in Disease of the Fundus.—W. J. Wellwood Ferguson (*British Medical Journal,* December 30, 1922) shows that the condition of the cerebrospinal fluid is well worth examining in many cases, especially that of young adults suffering from diplopia, optic atrophy, or retrobulbar neuritis. He considers the colloidal gold reaction of undoubted value as indicating the first definite sign of organic disease of the central nervous system; inasmuch as some of these cases later develop into frank disseminated sclerosis or neurosyphilis its value in early diagnosis and particularly in prognosis and treatment is considerable. Furthermore, it also may enable one to say whether a transient diplopia is or is not purely functional and may help to differentiate cases of retrobulbar neuritis and optic atrophy, indicating those in which the condition is part of a more general nervous disorder, and more especially those which may be followed after a considerable period by disseminated sclerosis.

Acute Cranial Injuries.—H. Jackson (*Surgery, Gynecology, and Obstetrics,* April, 1922) from clinical and experimental observations, concludes:

1. In most acute injuries of the brain, the cerebrospinal fluid pressure is a fair index as to the severity of the lesion. Dependable prognosis can be made by any increase or decrease of this pressure.

2. A new clinical classification of injuries of the brain based upon cerebrospinal fluid pressure alone, as shown by the mercury manometer, is superior to the accepted classification of concussion, contusion, and compression.

3. The pathogenesis of acute injuries of the brain demonstrates that the principal effect of the edema of the brain and hemorrhage is to interfere with the absorption of cerebrospinal fluid by the usual paths; this sets up a vicious circle causing further pressure on the brain by the accumulating fluid in the basal cisterns below the tentorium cerebelli and in the lateral ventricles which presses the brain upward against the dura and produces cortical anemia. The cortical anemia, if unrelieved, quickly leads to gliosis causing lasting changes in the character, disposition, and mentality of the patient, if he recovers from the brain injury.

4. The relief of the increased pressure on the brain and the reestablishment of the normal path of absorption of the cerebrospinal fluid can be obtained by repeated lumbar drainage—which in acute injury cases is absolutely without danger.

5. Lumbar drainage is superior to subtemporal decompression in relieving pressure below the tentorium cerebelli and has the further advantage that it leaves no mutilating skull defect. The use of concentrated salt solutions intravenously lowers cerebrospinal tension but does not remove blood.

Diagnosis of Intracranial Abscesses in the Ambulatory Period.—H. Aboulker (*Presse médicale,* June 3, 1922) notes that large extradural abscesses in the frontal, temporoparietal, and even cerebellar regions may not produce any symptoms, being only accidentally discovered in the course of resection of bone involvements or upon investigation of the dura. Consequently extensive and deep investigation of the dura must always precede puncture of the brain and should, furthermore, form part of the first stage of the operative intervention where the least suspicion of a reaction on the part of the meninges and brain exists. The classic symptomatic picture of brain abscess is frequently wanting even in the presence of extensive destruction of the temporosphenoidal lobe, cerebellum, or both. This symptomatic picture attaches rather to an aseptic meningitis with high pressure, which, indeed, sometimes coexists with abscess. These two disturbances are very similar, yet can be differentiated contrary to current opinion. Brain abscesses yield two constant and early signs, viz., headache with clouded mentality and an altered disposition. These cases should be looked for and subjected to operation during the ambulatory stage of their course, which is very prolonged, and at the time when mental clouding and depression and altered disposition begin to be manifest, before the stage of somnolence and stupor. General anesthesia, particularly chloroform, is to be avoided in cases of suspected meningoencephalic complication; local anesthesia by procaineadrenaline is, on the other hand, very satisfactory in these cases.

Tetanism in Meningitis.—H. Batty Shaw and Cyril Dee Shapland (*British Medical Journal,* February 3, 1923) find that meningitis may provoke tonic spasm of the facial muscles, producing risus sardonicus, of the muscles of the neck and of the abdominal wall; that the spasm may be constant, lasting for hours and even days; and that the spasm may become increased by irritation (nasal feeding, etc.), the patient remaining conscious throughout the illness. The view, formerly held, that such features constitute a clinical picture of undoubted tetanus must now be abandoned, because the disease may be accurately imitated by meningitis. The term "meningism" would be appropriate here as there is no inflammation of the meninges. The authors propose the term "tetanism" to fix the identity of those clinical conditions which simulate the very special form of toxemia produced by the growth of Bacillus tetani at some spot distant from the central system, and which may be dependent upon meningitis developed as a result of infection of the central nervous system by organisms quite different from Bacillus tetani.

The Nitrogen Method as an Aid to Differential Diagnosis in Mental Diseases.—R. V. Stanford (*British Medical Journal,* June 10, 1922), in view of the fact that the Wassermann and Nonne-Appelt reactions are not absolutely reliable in the diagnosis of general paralysis, advances an additional laboratory method of diagnosis. There is no choline or ammonia in the cerebrospinal fluid, but if the latter is taken from a case of general paralysis postmortem, decompositions occur with the production of 1, a substance giving the alkaloid reaction of choline although it is not choline, and 2, the ammonia salts form a platinichlorid distinguishable from choline platinichlorid only by polarization. The freshly obtained cerebrospinal fluid carefully handled does not show either of these two products.

The products of degeneration during life in general paralysis can be demonstrated by the following method: One c. c. of cerebrospinal fluid is heated with fuming sulphuric acid, the mixture is diluted with water, made alkaline and distilled into a series of Nessler cylinders where the ammonia is estimated by Nesslerization. The author calls the nitrogen number the number of hundredths of a milligram of total nitrogen per c. c. This number usually lies below twenty in cases of mental disease other than general paralysis and almost always above twenty-five in cases of general paralysis. In the graphic mode of representation illustrated, there is an ambiguous area between the numbers twenty and twenty-six. Whereas the nitrogen method not only reveals but measures the products of excessive catabolism in brain tissue, it does not indicate its cause; it also shows up other diseases like brain tumor, meningitis and cerebral hemorrhage, but these diseases are easily excluded by clinical methods. Normal cerebrospinal fluid shows total nitrogen values between fifteen and twenty-two. The approach or occurrence of death leads to a large increase in the nitrogen contents of the cerebrospinal fluid, but postmortem determinations are valueless. The differentiation between mania, melancholia and other common mental disorders, or between these and cases not insane, is impossible. The nitrogen values also indicate whether a condition is of a progressive or stationary nature. It was also shown that there is a difference between secondary dementia and mere senility, although the underlying physical condition is undiscoverable by any method.

Further Observations Upon External Hydrocephalus.—Cecil E. Reynolds (*British Medical Journal,* June 17, 1922) found that congenital external hydrocephalus shows certain differences of character from the acquired form. The congenital variety is frequently associated with microcephaly because of the diminution in expansile pulsation; the ventricles do not enlarge to any extent but the brain shrinks, the skull is arrested in its development and the subarachnoid and subdural fluids stay abundant because the foramina of Magendie, Key and Retzius are patent and often there is no tela choroidea or arachnoid covering the fourth ventricle. Many patients have normal sized heads but appear mentally defective with some bulbar paralysis and varying degrees of spastic or flaccid diplegia or pantoplegia. The legs are invariably affected more than the arms because the pressure is greatest at the leg centres at the vertex. An opening in the dura in this region, unless promptly closed, is almost inevitably fatal in these cases because of the rapid loss of cerebrospinal fluid. The safest approach is a graduated suboccipital deduralization in chronic cases; supratentorial measures are sometimes required subsequently. The flaccid type of this disease often has a better prognosis than the spastic. The congenital cases do not have fits; acquired cases always, even though the disease is acquired a few days after birth.

The acute specific diseases, especially tonsillar infections, as well as birth trauma, are the most usual causes of primary external hydrocephalus. The so-called *ex vacuo* accumulations of fluid are local collections of fluid in certain cases, but when extracerebral fluid is general, the brain has shrunk because the fluid accumulated and the fluid does not accumulate to fill the vacuum left by an otherwise unaccountable atrophy of the cortex.

Infectious Motor Paralysis in Young Rabbits.—J. Homer Wright and Eugene M. Craighead (*Journal of Experimental Medicine,* July, 1922) made an unsuccessful attempt to infect young rabbits and guineapigs through intracerebral inoculations with material containing in all probability the virus of infantile paralysis. However, a paralytic disease occurred which was spread among young rabbits apparently by simple contact. The disease was associated with a large organism which it is believed has not been hitherto described. Clinically the rabbits show a persistent drowsiness followed in most cases by tremor shortly before paralysis develops, which may be slight or marked, general or localized. The mortality is high. It was possible to reproduce the disease in other rabbits by intracerebral inoculations of sedimented urine, and also of cord emulsions from sick rabbits. The presence of the organism in the urine readily accounts for the spread of the disease by contact. Attempts to transmit the disease through the bites of bedbugs and mites were negative. Histological examination of the rabbits showed a wide distribution of the organism through the organs of the affected animals, with active destruction by the organism of the nerve cells of the spinal cord, which supplies the explanation for the paralysis observed clinically. The nature of the organisms has not yet been determined, but the authors suggest that it is probably an intermediate stage in the life of some protozoan parasite.

Periarterial Injections of Alcohol in the Treatment of Senile Gangrene.—W. Sampson Handley (*Lancet,* July 22, 1922) reports two cases of senile gangrene to illustrate a new method of producing vasoconstrictor paralysis unattended by the objections which are associated with the sympathetectomy of Leriche. In the latter operation, local constriction of the artery occurs and a period of low circulation (up to fifteen hours) precedes the onset of vasodilator symptoms which last three to four weeks. The initial extreme vasoconstriction lasting for fifteen hours may be dangerous in existing or threatened gangrene and the period of vasodilatation is all too short for the separation of a portion of the foot. In periarterial alcohol injections, there is no initial period of diminished circulation and the results of vasodilatation appear at once, without any temporary aggravation of the condition which the operation is intended to cure; no local contraction of the artery occurs at the site of the injury. In sympathectomy, the local injury of the muscular coat of the artery, causing a local muscular spasm, produces the initial constrictor symptoms, which is undesirable and avoidable with the method of alcohol injection. The latter method is also much simpler than excision of a lamina of the arterial coats. It should possess even greater value in the prevention of senile gangrene than in the treatment of gangrene which has already taken place. It may also prove to be applicable in other ischemic conditions of vasomotor origin.

Some Clinical Manifestations of Tabes Dorsalis.—Gordon Holmes (*British Medical Journal,* January 13, 1923) states that the diminution, complete loss, or alteration of sensibility to pinpricks in the distal portions of the lower extremities, the thoracic zone, the radial borders of the arms and the central portion of the face are the most common, the most definite and the most characteristic physical signs of tabes dorsalis. Such findings are often present when the knee jerks and the pupillary reactions are normal and before ataxia or other symptoms develop. This loss of sensation in these areas is a dissociated one, the different modalities being affected in different degrees, or some forms only may be disturbed; touch is frequently intact on the chest and face at least and the affection of thermal sensibility is inconstant. Dissociated analgesia of similar distribution is encountered in no other disease which enhances its value.

Alkali Reserve in Epilepsy.—S. Kjelland Mördre (*Norsk Magazin for Laege videnskaben,* August, 1922) concludes from his analyses of the blood and urine of epileptics that the alkali reserve in these cases measures a little higher on the average than it does in normal cases. This alkalosis may hardly be looked upon as anything more than an indication of the hypothetic toxin of epilepsy, if this theory is admitted. The fact that in one case the administration of fifteen gram bicarb. natrium increased the alkali reserve from sixty-nine to seventy-one per cent. of the carbon dioxide capacity in one hour, without any spasmodic or other reaction on the part of the patient would seem to refute the theory that alkalosis per se could be the cause of the attacks. In most of the cases observed by the author, the urine showed a normal NH_3 content, and in one case even a very low NH_3 content immediately preceding an attack. These findings were in opposition to the usual statistics, which report pathological quantities of NH_3 in the urine, particularly during the period immediately preceding the attacks. The author, however, admits that his limited material may account for this discrepancy in findings.

Neurosyphilis With Severe Laryngeal Crisis: Tracheotomy.—John W. Leitch (*British Medical Journal,* June 17, 1922) reports a case in which the symptoms point to an irritative cortical lesion as the most likely cause of the severe laryngeal crisis. A centre for the adduction of the vocal cords has been demonstrated in each cerebral hemisphere at the anterior part of the lower end of the ascending frontal convolution. Irritation of either centre results in adduction of both cords, while abduction is rather governed by the lower centres in the floor of the fourth ventricle.

A man, thirty-five years old, was found suffering with such severe respiratory embarrassment and cyanosis that a low tracheotomy was done. Unconsciousness had already set in and the tracheotomy was followed by convulsive movements of the arms and legs, but later consciousness returned. A superficial ulcer was found round the frenum of the tongue. Direct laryngoscopy showed the movements of the anterior parts of the cords to be normal but the posterior third moved sluggishly and did not approximate fully. The mucosa of the arytenoids and false cords was red and edematous. Recovery followed. Fifteen days after admission the patient showed a gumma in the left anterior pillar of the fauces and one week later another gumma in the sternomastoid muscle; both subsided within a week. Owing to the presence of the usual classical symptoms, syphilis was diagnosed.

The general convulsions may be explained by the extension of the irritation to the neighboring centres. The appearance and rapid subsidence of gummas elsewhere suggests a cortical lesion, while the paucity of localizing symptoms suggests a gummatous formation in the membranes of the cortical centre rather than in the brain substance. The possibility of an early tabes must also be considered; such crises are the early symptoms of this disease and may occur several times a year or oftener, but this does not negative the possibility of the laryngeal crisis being due to an irritative cortical lesion, caused by gumma.

The Occurrence and the Differential Diagnostic Significance of Tenderness of the Phrenic Nerve (Mussy's Point) in Diseases of the Abdominal Viscera.—F. Högler and K. Klenkhart (*Wiener Archiv für Innere Medizin,* October 15, 1922) draws the conclusion that the demonstration of Mussy's int of tenderness is important not only in thoracic ocesses but also in abdominal diseases, especially if e tenderness is over the right phrenic nerve. If is is found sensitive, the first condition to be ought of in the presence of negative findings in e lung is an inflammatory process in the region of e gallbladder. The best location to look for ussy's point is between the two heads of the ster- cleidomastoid muscle, where the phrenic nerve rns around the anterior scalenus muscle into the eper tissues and where it lies most superficially. ight pressure suffices to elucidate the tenderness.

The Results of Treatment in Syphilis of the entral Nervous System. — Reginald Hearn *British Medical Journal,* July 8, 1922) reviews one undred cases of syphilis of the central nervous sys- m. Nervous syphilis is much more likely to follow papuloerosive primary lesion. In this series of ses sixty-four showed no trace of any scar, thirty- ree showed only a slight and almost invisible scar; o showed scars typical of a papuloulcerative chan- e and only one case showed a scar of a primary anulating chancre. The more inconspicuous the ancre, the greater the likelihood of the develop- ent of late nervous symptoms. Seventeen cases owed the meningeal, interstitial, or late secondary pe of lesion, of which two were "neurorecurrences" llowing the use of arsphenamin.

All of these cases were restored to normal health, dged from the serological and pathological view- ints. Patients with tinnitus aurium were never lieved of this symptom. The subjective symptoms those who were afflicted with degenerative or renchymatous lesions were much improved by eatment. Of eighty-three cases treated, none owed any alterations in physical signs or the patho- gic picture of the cerebrospinal fluid and the lat- r was no criterion in determining whether a patient ith degenerative neurosyphilis required treatment. eneral paretics were improved and the onset of in- nity was postponed provided the treatment was gun before they became obviously stupid and in- tuous; the treatment was worse than useless and even hastened the fatal termination if the late age had already developed.

True Nature of Coxa Plana.—Calot (*Bulletin l'Académie de médecine,* April 24, 1923) main- ins that coxa plana is one of the radiographic ap- arances representing a special dystrophy of spinal cerebral origin which is the cause of congenital slocation of the hip, distinct or merely incipient. is never seen in normal hip joints, i. e., hip joints ee of congenital deformity. Conversely, in all hip ints exhibiting such deformity, coxa plana may pear at any time during the period from three to xteen years, in which osteogenesis and calcium etabolism are most active. In some instances the set of coxa plana is traceable to such causes as falls other traumatisms, overstrain, or intercurrent dis- ses that impair muscular tone. In all cases of coxa ana one can discover upon careful x ray and clini- l examination evidences of a dystrophic condition tending from the sacrum to the toes and involving e bones and soft tissues. There are many points of milarity between the congenital dislocation and coxa ana cases and tabetic joint disease and syringomye- . All are of central nervous origin, and all show a paradoxical combination of atrophy and hypertrophy of the hips in the same individual, or even in the same hip, the two processes existing side by side. All are frequently bilateral, bacteriologically negative, and unreproducible experimentally by factors acting on the hips alone. While a traumatic dislocation is possible, the true lesions of congenital luxation or coxa plana never result. Such lesions could only be produced by first inducing a hydrops of the cord or brain or a hydromyelia such as that found in Lannelongue's autopsies. Coxa plana may be observed either in reduced or unreduced congenital hip dislocations. Irregular pressure of the dystrophic bone surfaces may be the cause of the condition.

Sugar Findings in Normal and Pathological Spinal Fluids.—A. G. Kelley (*Southern Medical Journal,* June, 1923) has studied the sugar content of normal cerebrospinal fluid, the effect produced on this content by the inoculation of colon bacillus, staphylococcus aureus, pneumococcus, and meningococcus, and, on rabbits, the effect produced on the sugar content by large intravenous injections of dextrose. He then studied the sugar content of the cerebrospinal fluid in various diseases, but especially in syphilis of the nervous system. From the results of his observations he thinks it justifiable to conclude 1. That the sugar content of cerebrospinal fluid is decreased in untreated cases of syphilis of the nervous system, in meningitis due to the meningococcus, the staphylococcus aureus and the pneumococcus, and in moribund cases. 2. That as cases of syphilis of the nervous system are treated, the sugar content gradually approaches the normal and on this account repeated estimations of the sugar content of the cerebrospinal fluid in these cases may possibly be of prognostic value. 3. That there is sufficient evidence to warrant the opinion that the Treponema pallidum, when present in the cerebrospinal fluid, utilizes the sugar normally present in the fluid.

Foul Odor as an Epileptic Aura.—M. Briand (*Presse médicale,* May 2, 1923) refers to the case of a patient who had had a skull injury and was subject to epileptic seizures. A few minutes before the seizures a very distinct nauseous odor as of decomposition or putrefaction was set free by this patient, and served as a warning to his associates, who at once adopted precautions relating to the oncoming paroxysm. The odor passed off a few minutes after the attack. The patient's clothing did not retain any of the odor. Perspiration could be ruled out as the source of the odor. There were no eructations nor borborygmi; consequently, the odor did not seem to come from the stomach. By exclusion, the conclusion was reached that it was exhaled from the lungs. The question of odors set free from the human body is still very obscure.

Contributions to the Clinical Appearance and Pathology of Tetanus.—Herb. Elias and Stef. Weiss (*Wiener Archiv für Innere Medizin,* April 5, 1922) proved that the increase of the inorganic and total phosphorus in the serum of cases of tetanus did occur. The inorganic as well as the total phosphorus is not reduced to normal with the onset of the latency of tetanus, but on the contrary it even increases for some unknown reason during this time, sometimes quite considerably.

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Diagnosis and Treatment of Tetany.—Stewart R. Roberts (*Southern Medical Journal,* August, 1923) says that if the general therapeutic indications in the treatment of tetany are once understood, the details fashion themselves very easily.

1. To stop the convulsions and spasms, relieve the laryngospasm and lessen the irritability of the nervous system.

a. Morphine is given hypodermically in doses from one sixtieth to one fourth grain, and chloral hydrate from two to twenty grains by mouth or rectum. When the convulsions are extreme, chloroform inhalations may be necessary. Repeated hot baths are extremely soothing. In one case I felt that two lumbar punctures aided in relieving the severe and repeated convulsions.

b. The laryngospasm requires active treatment. Warm baths, castor oil, high warm enemas, chloral and hot stupes to the neck are advisable. When the child is in apnea, cyanotic, and dissolution threatened, dashing cold water on the face and body or quickly elevating the feet and lowering the head may help. Intubation apparently is useless.

c. Since Marriott and Howland have shown the fall in the calcium content in the blood serum in tetany, a chemical reason on a more permanent basis is proved for the therapeutic use of calcium to relieve the convulsions and spasms. Calcium chloride is the drug of choice given in doses of five to fifteen grains four to six times daily. It requires from one to two days before it influences the disease, and should be continued for a long time, say three to six weeks, inasmuch as it is eliminated very rapidly. In emergency, it may be given intravenously in normal salt solution in ten to twenty-five per cent. strength.

2. During the acute attack, cow's milk should be withdrawn or greatly diminished and cereals and gruels substituted. In older children and adults the fresh vitamine containing vegetables are in order. A well balanced diet is indicated when possible.

3. Hygienic measures are particularly important In one case I was impressed with the improvemen when the child was given abundant fresh air and sunshine.

4. When tetany is associated with another disease which bears to it a causal relationship, treatment of the primary disease is essential.

a. Tetany associated with rickets emphasizes the treatment of rickets and the administration of cod-liver oil and small doses of phosphorus. These can be given in one prescription. In children ten drops of the oil in each dose is often sufficient.

b. Tetany associated with pregnancy usually continues until the pregnancy is interrupted or terminated naturally. Lactation tetany demands the cessation of nursing if large and continuous doses of calcium are unavailing.

c. Gastric tetany associated with pathology of the stomach, duodenum or colon usually demands surgical and mechanical aid. The mortality here is high on account of age and the danger of operation. The prognosis is grave if the stenosis is cancerous in origin, hopeful if benign.

d. Tetany associated with and following operation upon the thyroid gland intimate the necessity for the use of the parathyroid hormone in the form of the tablet. The organotherapy seems useless in tetany from other causes. Parathyroid transplants and grafts may be considered in such rare cases.

Hypselophony. A New Method of Examination.—Ante Grgurina (*Wiener klinische Wochenschrift,* August 3 and 10, 1922) reports a new method of examination, consisting of the production of different kinds of characteristic sounds. The following three phenomena are the most important 1. The slapping phenomenon—slapping with the volar surface of the finger in short and rapid blows simultaneous auscultation shows a distinct metallic-sounding noise in the presence of a pleural exudate 2. The blow phenomenon—short blows with the volar surface of one or more fingers; a metallic, high-sounding, sawing noise is heard on the back in the presence of the pleural exudate. Although the slapping phenomenon is positive also in extrapulmonary tumors, the blow phenomenon is negative in such conditions. 3. The pocket alarm clock phenomenon—the edge of a pocket alarm clock is placed on the border of an area of extrapulmonary dullness and a positive sign shows a metallic, rattling noise on the back.

Treatment of Epilepsy.—John McCartney (*British Medical Journal,* January 6, 1923) treated eighteen patients by the following method: The patients were put on potassium bromide ten grains, borax purificans five grains, and Fowler's solution two minims, three times a day. This dosage was gradually increased and the best results were obtained with potassium bromide fifteen grains, borax purificans 7.5 grains and Fowler's solution two minims, three times daily. A laxative was also given at bedtime.

Continuous treatment given along these lines showed no deleterious effect on the health of the patients, producing no gastric or skin disturbances and even produced a general improvement in their physical condition.

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Has Adrenin Any Physiological Value in the Organism?

An Answer to the Destructive Criticism by Some Modern Physiologists of the Physiopathology of the Suprarenal Glands

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From 1902 to 1909, when my monograph on the pathology of the suprarenal apparatus and of the parasympathetic organs was published, (1) I made a series of researches on the experimental physiopathology of the suprarenal glands at the Institute of General Pathology of Rome. Since that time this important question has been investigated by me from the clinical point of view. I trust that my twenty years of work will justify my temerity in opposing with countercriticism, based upon facts and observations, for the most part personal, certain hasty and revolutionary ideas given forth by several well known physiologists in the past five years. These authors, Gley, Hoskins, Stewart, Swale Vincent, have promulgated ideas which may be summed up in this statement: Adrenin has no physiological importance in the organism, it is probably a product of waste or excretion (Gley), or a relic of a remote philogenetic epoch (Stewart). They also assert that the syndromes of adrenal insufficiency are purely inventions of clinicians of uncurbed imagination (Stewart), inasmuch as all the suprarenal functions devolve upon the cortical substance.

The most stubborn and bluntest critic of all is the Cleveland physiologist Stewart: it is therefore by a calm, dispassionate analysis of his conclusion (2) that I shall refute them one by one, in order that I may be able to affirm that not one of them resists the test of clinical and experimental facts, based upon accurate observation and interpreted with common sense.

STEWART'S AFFIRMATIONS.

1. The syndrome of suprarenal insufficiency shows nothing definite or characteristic. The anorexia, the muscular asthenia, the hypopyrexia which precedes by twenty-four to forty-eight hours the death of the totally suprarenalectomized animal, are not pathognomonic, except possibly the muscular weakness which progresses more rapidly than in animals dying from other experimental conditions. Further, the rapid emaciation, the grave loss of weight (which according to Stewart was observed by Elliott in 1914 although others, including myself, had emphasized it many years before) is due largely to the anorexia of the animals operated upon.

Whoever has attempted to bring about a slow syndrome of adrenal insufficiency experimentally, must have been struck by the constancy and clearness of a series of symptoms which develop always in the same order, are always the same and differ from the symptoms which are observed in animals which have been thyroidectomized or hypophysiectomized. These are analogous experimental syndromes to, but not identical with, the syndrome of suprarenalectomy. In certain cases of suprarenal insufficiency artificially produced and slow in progress, one may observe an intermittency of certain of the most characteristic symptoms, such as muscular asthenia, especially in the posterior extremities, their temporary latency, and their reappearance and aggravation with the progress of suprarenal destruction. I have brought about this syndrome of slow suprarenal insufficiency in which at first the right suprarenal gland was removed and half of it grafted into the omentum of the same animal. Later, after fifteen to thirty days, the left suprarenal was removed. In the cases where the graft was successful I was able to keep the animal alive for a month after the second operation, while animals did not live over ten days when the two suprarenals were removed in three stages.

Now in those animals in which the only functionating suprarenal tissue was that of the graft of one half of one gland, the experimental conditions were similar to those seen in man with an advanced functional or anatomical alteration in both suprarenals, which however is still compatible with life. As in

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these cases occasionally a minute fragment of suprarenal tissue suffices to render almost entirely latent the clinical syndrome (this sometimes consisting merely of a mortal paroxysm more or less unexpected and sudden), so I have noted in several kittens operated upon by the above method, a latency or intermittency of some symptoms for several days, and then rapid unexpected death of the animal with the usual symptoms of total suprarenalectomy. Only one symptom was never lacking in our experiments, even with long prolongation of life and slow development of the syndrome. This symptom was the progressive emaciation, on which, however it did not seem to me depended directly the other characteristic and constant signs of acute or chronic experimental hypoadrenia.

These signs are hypopyrexia, muscular weakness more marked in the posterior limbs, somnolence, pallor of the visible mucous membranes and ischemia of the skin. Neither do I believe that such emaciation can be attributed to anorexia. Stewart's first affirmation is not therefore sustainable.

2. "In the experimental suprarenal syndrome there is no correspondence between the gravity of the symptoms and the quantity of suprarenal tissue removed."

This objection is of no value: with all endocrine glands, frequently a fragment of gland suffices to keep the syndrome or insufficiency latent. One of the cardinal principles of endocrinology which I set forth in my treatise on endocrinology (2) is that "the clinical symptoms do not correspond with the pathological anatomy of the ductless glands."

In man, as in animals, there is no definite correspondence between the extent of the lesions and the gravity of the symptoms, until the lesion reaches a stage where the organism can no longer utilize its complicated mechanisms of functional compensation. Then the syndrome bursts forth and progresses more or less rapidly. Finally, as I have emphasized above, it is not true that a certain gradation of hypoadrenal symptoms cannot be experimentally produced. Even in puppies and kittens deprived of one adrenal gland, I have shown, as did Vassale, Silvestri and Tosatti and Ferreira de Mira, the existence of a latent or partial suprarenal insufficiency which manifested itself on the addition of an aggravating factor such as an infection of the operation wound, or pregnancy, exactly as is seen in animals which have been partially thyroidectomized or parathyroidectomized.

Therefore, Stewart's second statement is not justified.

3. "The essential alterations produced by suprarenalectomy have to do with metabolism, but there is nothing definitely known about them."

On the contrary, the researches of the Italian authors Segale and Mariani, and those of Noel Paton and of Gradinescu, confirmed recently by the American writers, demonstrate the slowing of the basal metabolism and of protein digestion in suprarenalectomized animals. Further, they have shown the important regulating rôle played by adrenalin in protein metabolism, in the production of creatinin (Roux and Taillandier) in the renal elimination of urea and creatinin (Marshall and Davis.) To this same adrenalin Stewart denies any action whatever. To the above may be added the undeniable part played by the suprarenal cortex in the metabolism of lipoids.

4. "The arterial hypotension and the rapid muscular asthenia of suprarenalectomized animals are not sufficiently specific to be referred to the absence of the suprarenals." Here Stewart, who has already admitted a certain specificity in the muscular asthenia, forgets this and also that in patients with Addison's disease, as has been recently stated by Marañon in his criticism of Gley, arterial hypotension and muscular asthenia are conspicuous and early symptoms.

Even if they are not constant, their significance is not lessened for the reasons given in No. 2. They are not antemortem symptoms and are never found in any other morbid state as dominant, persistent and characteristic as in lesions of the adrenals.

5. "The hypoglycemia found in suprarenalectomized animals is of no value, it is found here in animals which are moribund." In this regard, experimental researches are contradictory: hypoglycemia has been found by some and not by others in adrenalectomized animals again, it has been found in some animals and not in others. The question has not been settled, as Stewart believes. This symptom, when it exists, is not only found in dying animals as demonstrated by the clinical observation of the frequent existence of hypoglycemia in patients affected with Addison's disease. Marañon, Carrasco and Soler are among the more recent observers in this regard.

6. "The emaciation observed by Abelous and Langlois in guineapigs partially adrenalectomized is not easy of interpretation; it may be due to operative trauma."

Here Stewart forgets that Elliot, whom he also quotes, and all other experimenters have noted the early appearance and gradual development of this fundamental symptom. (See also my experiments quoted in No. 1). Also in the ligation of the suprarenal veins recently performed by Hartman and Blatz in America, a visible emaciation was found in some animals.

This emaciation is never lacking in Addisonian patients. The hypothesis of Stewart that the emaciation depends upon the trauma of operation is without foundation.

7. "Whipple and Christman have demonstrated that in dogs with three fourths of their suprarenal tissue removed, the elimination of phenoltetrachlorphthalein in the bile is diminished; it increases if the remnant of suprarenal tissue hypertrophies.

Stewart remarks that this is truly suggestive but that pancreatic deficiency brings about the same phenomenon."

But what does that signify? Does it take away the value of experiments which demonstrate once more the part played by the suprarenal glands in metabolism?

8. Hoskins in 1915 showed that in dogs surviving the removal of five tenths to six tenths of their suprarenal tissue, the vasomotor reaction to nicotine is diminished and he concluded that partial suprarenal insufficiency diminishes sympathetic excitabil-

ity. What has Stewart to bring forward against these experiments?

9. Stewart and Rogoff, as also Gley and Quinquand, affirm that the hyperglycemia of bulbar puncture, from ether anesthesia, or from asphyxia, is seen equally when the suprarenals have been extirpated, contrary to what had been believed from the experiments of others. This would deny to adrenalin any influence on the hyperglycemia of bulbar stimulation.

But in 1920 Negrin and Hernandez Guerra confirmed experimentally the relationship between bulbar glycosuria and hypersecretion of adrenalin. This does not preclude the possibility that the bulb may act directly on the liver to bring about a hyperglycemia; the two mechanisms producing this, namely the direct neurogenic and the secondary neurohormonic or sympatheticoadrenal, do not exclude one another.

10. "There is no difference in the resistance to fatigue in normal animals and those with grave insufficiency of adrenal tissue."

This affirmation of Stewart, in disagreement with previous physiologic experiments and clinical findings, is experimentally unjustified and premature in view of the excellent recent researches of Hartman in America, according to which there exists a direct parallelism between muscular work and the quantity of adrenalin which enters the blood. According to the same researches, adrenalin increases the functional capacity of the muscles and combats the toxic effects of fatigue. These researches are a striking proof of the great importance of adrenalin in muscular physiology.

Now let us examine the arguments of Stewart who attempts to deny any physiological value to the medulla and to assign to the cortex alone any functional value.

11. "If one suprarenal gland is removed from an animal and the nerves of the other gland severed, thus preventing in great part the excretion or mobilization of adrenalin from the medullary tissue into the veins, the animal does not present any disturbance; hence, says Stewart, adrenalin in the blood is of no consequence."

Before discussing the value of this experiment, I wish to draw the attention of Stewart to the fact that this experiment was first performed by me in 1903, as has been recognized in Italy, in Germany and in France (probably news of Italian experiments are late in arriving in America).

After my experiment, it was repeated in the Institute of Medical Pathology in Naples, directed by Professor Castellino, by Pellegrino in 1904, and by Giovine. I first showed that section of the splanchnic nerves and of the solar plexus slowly brought about a progressive atrophy of the medullary tissue of the suprarenals, or of the corresponding suprarenal if the section is unilateral, also an intense vasodilation of the entire gland. Immediately after the enervation, the chromaffin cells do not show demonstrable changes; this fact was reobserved by Elliott. Now I found that in kittens, by removing the right suprarenal and cutting the nerves of the left one after fifteen to thirty days, the animals did not present appreciable symptoms, other than a slight subnormal temperature.

However, I was careful not to conclude, as does Stewart, from these observations, that the abolition of the supply of adrenalin in the blood, and the neurogenic atrophy of the medulla of the remaining gland, demonstrated the uselessness of adrenalin in the organism. Stewart himself found that the entrance of adrenalin into the suprarenal veins, even when reduced to 1/100-1/1000, is abolished after section of the nerves, and we know that an infinitesimal quantity of adrenalin may suffice to keep latent the symptoms of its insufficiency. One year after my experiments, Pellegrino, by severing the nerves of one gland and removing the other at the same session, caused the death of the animal just as though both glands had been removed simultaneously.

Finally, the most important, it is impossible to deny that enervated medullary tissue may still exercise a beneficial function in the organism, because it is contrary to the concept valid for all the endocrine glands, and well shown by the grafting experiments, to admit that they function only under the influence of their secretory nerves. Actually my transplantation experiments with the suprarenals have shown me that the best results are obtained when the cortex and medulla are transplanted at the same time (here the medulla is free from nerve control).

We may add that even when the suprarenal medulla is atrophied or paralyzed, as to its excretion of adrenalin into the blood, there remain many chromaffin cells scattered through the whole sympathetic which pours adrenalin into the circulation. Stewart and Swale Vincent refuse this objection because they believe that the section of the abdominal splanchnics and the removal of both suprarenals will produce death equally surely in spite of the existence of the abdominal paraganglia; hence the latter and their adrenalin are of no value just as are the medullæ of the glands.

To the first argument we may reply that, even when the abdominal paraganglia are enervated, there remain many nests of chromaffin cells in the thoracicocervical sympathetic which are not influenced by the cutting of the splanchnics. To the second argument we may answer that the fact that the presence of the paraganglia does not suffice to preserve from death the animal deprived of both suprarenals may be interpreted, as was done by me in 1909, to mean that only the physiological unity of the cortex and medulla is capable of supplying the exigencies of life.

12. "The ligation of the suprarenal veins does not determine hypotension, nor does the pressure rise after the release of the veins (Young and Lehmann's experiments, contrary to the results of Strehl and Weiss); therefore, adrenalin, whether it enters the suprarenal veins or not, does not modify the arterial pressure."

Apparently this is an impressive fact; however it is sufficient to consider that recent accurate experiments by Hartmann and Blatz in ligating the suprarenal veins, with a histologic study of the glands, demonstrate that even with the veins ligated adrenalin may continue to enter the circulation by infiltrating through the cortex, whence it may reach the general circulation by the anastomosis of the suprarenal veins with the renal veins. Further, it is known that in other endocrine glands, as the thyroid, the ligation of the veins (Mattioli) does not abolish the entrance of the secretion into the blood stream nor the function of the gland. Again, if the experiment of ligation of the veins demonstrates the uselessness of the adrenalin in the circulation, why do not Stewart and Vincent conclude that the cortical secretion is valueless if it is prevented from entering the circulation by the ligation of the veins?

Hartmann and Blatz have in fact observed phenomena of hyposecretion of cortical lipoids after ligation of the veins.

This experiment, for my part, has no demonstrable value either for or against the value of adrenalin, since the observations on the animals were carried out for a limited time, and we know that even when both suprarenals are removed a certain period must elapse, up to twenty-four to forty-eight hours, before the appearance of the first hypoadrenal symptoms.

13. "According to Stewart and Rogoff (Cannon to the contrary) the acceleration of the enervated heart, whether from psychic stimuli or stimuli of sensory nerves, is not due to the adrenalin supply; this adrenalin has nothing to do with emotional reflexes."

Recently the researches of Cannon, Undill and Griffith have shown, on the contrary, that it is really the adrenalin which determines acceleration of the heart.

The socalled emergency theory of Cannon has been recently well demonstrated by the above mentioned researches of Hartmann with regard to the increase of adrenalin in the circulation during muscular exertion.

Again, the researches of V. Anrep in great part confirmed by Vincent and Pearlman, demonstrate the importance of the presence of adrenalin in the blood in the determination of the typical curve of splanchnic stimulation observed by Elliott (which Gley and Quinquand had denied).

14. "When one suprarenal is removed the other hypertrophies and the hypertrophy involves only the cortex; this is a sign that it is the more vital part."

Based upon my own observations, which agree with those of Lucibelli, Simmonds, and Karascheff, this compensatory hypertrophy involves also the medullary portion.

15. "Only the cortex of a transplanted suprarenal gland grows."

This is in no wise true. I found in the cat, and recorded graphically, the temporary growth of the chromophile cells, which was observed by M. Christiani in the rat, and by Busch, Leonard, and Wright in the rabbit.

The possibility of securing growth in transplanted medullary tissue prompted me to attempt experimentally to separate the syndrome of insufficiency predominantly cortical from that predominantly medullary.

As I have stated I extirpated at the first sitting the right suprarenal, and at the same time ingrafted one half of it into the omentum; at a second session after fifteen to thirty days I removed the left suprarenal.

In the cases where the graft necrosed, the animal died in from two to four days with the usual syndrome of acute suprarenal privation just as after the extirpation of both glands in two stages. Three kittens survived for ten, fifteen and thirty days respectively; in the one which lived ten days, the day after the removal of the left gland the symptoms of hypoadrenia were manifested and progressed steadily until death. Examination of the grafted gland showed absence of chromaffin cells, and the presence of several islands of well preserved cortical tissue.

In the animal which survived fifteen days an interesting fact was noted, namely, that for fifteen days there was complete absence of all symptoms of adrenal insufficiency, except for a slight degree of emaciation. On the fifteenth day the animal unexpectedly was seen to fall back on his hind limbs, unable to move; this was followed by somnolence, hypopyrexia and death. In this case, examination of the graft showed complete sclerosis of the cortex, while almost the whole medulla remained in an atrophied state.

The third kitten lived a month after the extirpation of the second gland and showed, the day after the operation, falling of the hair, constipation, and pallor of the mucosae. These symptoms disappeared and returned in an intermittent form, while the emaciation progressed, although the animal was being fed sufficiently well.

On the twenty-ninth day there appeared marasmus, complete asthenia, stupor, barely perceptible arterial pulsation; on the thirtieth day death supervened after an attack of generalized convulsions.

Here examination of the graft showed many medullary cells preserved in the centre of the fragment; whereas only a few elements of the glomerular zone of the cortex were visible. While not denying the difficulty of interpreting these three experiments, and admitting their small number, nevertheless I felt justified in deducting therefrom that the longest extension of life by the preventive action of gland grafts in suprarenalectomized animals is seen when the medullary portion grows as well as the cortex.

In such a case there may be brought about a complete absence of symptoms and, analogously to what is seen in grave latent suprarenal alterations, sudden death may supervene in the animal from complete adrenal privation, when the number of growing grafted cortical cells has become absolutely insufficient.

As an hypothesis I admitted that the presence of cortical tissue is necessary in order that the medullary cells may functionate properly in the organism.

No one has succeeded in demonstrating with certainty that the presence of cortical tissue in the organism suffices to prevent the death of the animal after extirpation of the adrenals.

The experiment of section of the nerve of one gland after the extirpation of the other is not a satisfactory one for this purpose. Neither are the experiments of Wheelon, repeated by Ciaccio, (verbal communication) which were aimed at the possible destruction of the medulla of both glands without endangering life.

Here there is lacking histological demonstration of the complete destruction of the medullary cells which we know penetrate the cortical zone here and there. Furthermore, these severe operations on the medulla cannot leave intact the structure and functional integrity of the cortex.

An opinion which has many arguments in its favor is that both cortex and medulla form a physiological unit, as they are in the same organ, inasmuch as the blood, after having infiltrated the cortical zone and taken up the secretions of that zone, finally bathes the medullary cells. Again, an enormous number of nerve branches are distributed not only to the chromaffin cells but also to the cortex, especially the reticular zone which is richest in nerve endings. It is not possible either experimentally or clinically to dissociate the cortex from the medulla whose union, always more intimate in philogenetic progress, can have no other significance than a functional progression of the organ in the higher animals. Here, in my opinion, we should seek the reason for the experimental and clinical fact that the two substances, united together, cannot be so perfectly substituted that life may be preserved, by numerous chromaffin cells and accessory cortical cells scattered throughout the body.

We shall state that in spite of the fact that Swale Vincent has recently denied any physiological value to this corticomedullary union, nevertheless, Lowenthal, Bauer, Vignes and others maintain the importance of the anatomical and physiological relationship existing between these two tissues.

This is a problem which will be solved some day by biological chemistry just as it has begun to solve the mystery of the union of the prepituitary and the postpituitary.

16. Stewart's last affirmation is truly inexplicable, namely that clinicians, mostly the French and Italian, look upon suprarenal insufficiency in man as solely an insufficiency of adrenalin. Thus they base their nosographic and pathogenetic construction of hyposuprarenalism on nothing, according to Stewart, because no action of adrenalin whatever on the organism is demonstrable in the laboratory.

Firstly, it is not true that the clinicians stand upon adrenalin insufficiency; I was among the first to sustain, with Biedl, the importance of the cortex, and to apply, as I have done clinically, the theory of the physiological unity of the cortex and medulla.

Further, Sergent has defended himself against the same unjust accusation of Stewart. I have for about fifteen years advised administration of both cortex and medulla, not adrenalin alone, in suprarenal insufficiency.

As for the statement that clinicians have no right to speak of a syndrome of medullary hyposuprarenalism, because a few laboratory experts maintain that adrenalin has no action, this is a contention which has no exact basis in animal experiments, as we have shown in our critical analysis of Stewart's arguments. How can all value be denied to experiments demonstrating the participation of adrenalin in basal metabolism and muscular action?

There has been much ridicule in America of the theory of tonus, still adhered to today by clinicians, and according to which, one of the functions of adrenalin is to contribute to the maintenance of vascular tone, and the tone of the other organs innervated by the sympathetic.

One cannot deny the great significance of the law of Langley-Elliott, that adrenalin acts upon the tissues in the same manner as the stimulation of the sympathetic nerves which supply those tissues. Neither can the impressive fact be denied that in the whole series of vertebrates, and also in invertebrates, the chromaffin cells and sympathetic cells are derived from a common matrix and live and functionate together, This is an admirable proof of the intimate correlation between chemical and nervous stimuli. Nevertheless an attempt has been made (Hoskins) to deprive adrenalin of all regulating action on the sympathetic excitability, because of the observation that adrenalin, injected into animals in minimal doses, brings about hypotension instead of hypertension. This has been adduced to further the claim that adrenalin cannot act as a vasotonic hormone in the minute doses in which it enters the blood stream.

However, it has not been considered that adrenalin, even in minimal doses (Cannon, Collip) may act either as a vasoconstrictor or a vasodilator, according to the various vascular regions and the receptivity of the bloodvessels on which it acts. This is just the attribute of a substance truly capable of regulating the general vascular tone. This tone is not destined to produce general vascular constriction of all the bloodvessels of the body, but rather to provide an equal distribution of the blood in case of changed hemodynamic exigencies.

Now adrenalin, as some opponents of the theory of "tone," as Vincent, have decided, is, in certain contingencies artificially produced (the only one of the known hormones) capable of providing for the even distribution of blood in the body. Why then cannot this occur in physiological conditions?

As I have insisted for many years, that we cannot declare, as has been airily done recently, that adrenalin is a hypertensive hormone; it is hypertensive according to the needs of the organism. Does not the tonic function of the cardiovascular apparatus consist precisely in this regulating property of blood distribution?

It is difficult to understand why Hoskins, enthused over the chemical isolation of thyroxin by Kendal as the active principle of the thyroid, claims this to be the tonic *par excellence* which stimulates cells in general, and at the same time denies to adrenalin any tonic action on the sympathetic. This he denies to adrenalin, a substance which has so many analagous actions to those of thyroxin, such as stimulation of basal metabolism, independent of the presence of the thyroid; stimulation of thermogenesis in hibernating animals (Adler); stimulation of the cervical sympathetic, etc.

But, says Gley, a physiological adrenalinemia cannot be demonstrated: the search for adrenalin, which is positive in the blood of the inferior vena cava below the entrance of the suprarenal veins, is negative in the right heart.

This, however, is one of the weakest reasons for denying to adrenalin any importance as a physiologically active hormone.

In fact, if it is admitted that adrenalin enters the suprarenal veins from the medullary tissue, that its flow is regulated by the nervous system, that the hormone is recovered from the blood of the inferior vena cava, that it is capable of acting in extremely weak dilutions, then how can it be denied that it exists in the general circulation, merely because our defective technic is not successful in discovering it when it is diluted in the great mass of the blood? Might it not be said that the hormone is fixed immediately in the tissues to which it is destined?

Marfori and Marañon justly rebut the objection of Gley, saying that, even when we inject adrenalin into animals or man, examination of the blood during the period of maximum action of the hormone will not reveal its presence in the blood by the most delicate biological tests.

Can it be denied in such case that an adrenalinemia has existed or that it has been artificially produced in the animal if only for an instant?

Even if the opinion of Cannon were correct that an adrenalinemia occurs only in cases of special emergency by the call of the chromophile tissue by nervous impulses, how could this lessen the great value of adrenalin in the normal organism?

Are we able, in the case of the other glands such as the thyroid, the pituitary, to demonstrate the presence of their respective secretions in the circulating blood?

Do Gley, Vincent, Stewart and Hoskins deny the existence of the thyroid, pituitary and other hormones which physiologically enter the blood (we know not whether continuously or intermittently) to perform important functions? I shall not delay here to demonstrate how the crusade against adrenalin by famous French and American research workers is destined to fail, because it has not a single serious experimental foundation in its favor, even if we set aside, which we shall never concede, the positive contributions in favor of the importance of adrenalin, furnished by clinical experience, which Stewart holds in such disdain.

It is strange how lightly the opponents of the physiological importance of adrenalin substitute hypotheses for facts as to the importance of this substance in the organism.

Thus Gley, in saying that it is a waste product, an excretion, forgets that in admitting such to be the case, he is up against his own objection in not being able to demonstrate this product of excretion in the general circulation, as can be done with other such products.

Further, it is inexplicable how an excretion begins to be produced in the earliest months of fetal life, which has such specific stimulating properties on the sympathetic and which is so actively regulated by secretory or excretory nerves. This is truly a precious excretion which is not to be discarded as a waste product in clinical therapeutics.

Stewart thinks that adrenalin is, as it were, a relic of an ancient philogenetic era, in which the chemical stimuli were of more importance in the organism than nervous stimuli. On the contrary, we see that the chromophile tissue, especially the medullary tissue of the suprarenal, is one which develops late, and that even after birth chromophile cells continue to be formed from the sympathetogones in the suprarenals (Wiesel).

What is to be said of the hypothesis cherished by Gley and his followers (Porak for example) of the exclusive importance of the cortex in suprarenal physiology?

The French authors are not willing to abandon the antitoxic theory of the endocrine glands. This theory, which von Biedly and I have combatted for many years, and which Marañon, who was once its advocate, now admits with praiseworthy scientific honesty (3) to be unfounded, is derived from the theory of Gley and Porak as to the antitoxic function of the suprarenal cortex through the medium of its cholesterin secretion.

We shall not insist again on the frail basis of this doctrine of cortical antitoxic action, confining ourselves to the statement with Marañon (4) that on the one hand, the relation of the cholesterin of the blood with the cortical secretion is yet to be demonstrated, while, on the other hand, there is no parallelism between the cortical cholesterin secretion, the degree of cholesterinemia, and the antitoxic and antibacterial power of the blood. It is remarkable that the same criticism of Gley of the theory of medullary function has not been applied by the great Parisian physiologist to his hypothesis of the cortical antitoxic function as being the exclusive function of the whole gland.

It is better, as to the function of the suprarenal cortex, to maintain still a prudent reserve, as I did in my monograph of 1909, and to admit simply a relationship not yet precisely defined, between the cortical secretion and lipoid metabolism, and with the elaboration of pigmentolipoid combinations. The latter function, as Laignel Lavastine has shown, is controlled by the nervous system through the solar plexus. Further, the cortex must have a great influence on the trophism of tissues which are highly differentiated and rich in such pigmentolipoid combinations, such as nervous tissue, genital gland tissue, and the Malpighian mucous layer.

It is of interest to touch upon one last point; this is the relationship of certain attenuated forms of adrenal insufficiency, which lie on the borderline between physiology and pathology, and certain individual constitutions and temperaments. This relationship has been especially studied in Italy by Castellino and his pupils, by myself, and has found support in Germany (Brugsch, I. Bauer, Wiesel and others) as well as in Spain, France and elsewhere.

Such hyposuprarenal constitutions, according to Stewart and Hoskins, are fantastic constructions, for the sole reason that they cannot be experimentally reproduced!

This would mean that clinical medicine (whose latest and most recent task is exactly that of defining borderline states between health and disease, temperamental morbid forms, or subpathological or premorbid states) should renounce this mission, which we consider one of the highest of modern medicine, simply because the laboratory is still unable to solve the problems of morbid constitutions and temperaments.

Fortunately there are, among the most keen experimenters, level heads who feel that even in precise laboratory tests they cannot do without the light that comes from the patient. Von Biedl, in the last edition of his well known treatise on endocrinology (now on the press), devotes hundreds of pages to the examination of the individual constitution, in its relationship with the physiology and pathology of the internal secretions, thus giving all his authoritative support to the trend which we have followed for many years in clinical endocrinology.

Therefore, in this field, the criticism of the American physiologists, who as Hoskins recognizes, have imperfectly understood the constitutional tendency of modern medicine, is shown to be premature, risky, and not guided by sane clearness of thought and scientific method, which alone can prevent even the most brilliant scientist from falling into gross errors of common sense. We can then understand how an investigator of the calibre of Stewart, in his attempt to destroy the value of clinical facts, with which he has little familiarity, and to accuse the clinicians of inventing the syndromes of suprarenal insufficiency, cites a case of Claude and Gougerot in which during life there existed asthenia, melanodermia, arterial hypertension of 90 m.m. In this case the adrenals were atrophied, reduced to half their normal size, although apparently histologically unchanged; this patient was tuberculous.

Now, says Stewart, in animal experiments it is sufficient to leave a fragment of suprarenal tissue in order to prevent the appearance of the symptoms of Claude and Gougerot's patient with suprarenal atrophy.

Whoever has had any anatomical and clinical experience with Addison's disease, knows that simple or sclerotic atrophy is not a rare lesion as has been established by Bittorf. And do we not find thyroid atrophy as an underlying pathogenetic factor in many cases of myxedema; do we not find hypoplasia or atrophy of the pituitary as an anatomic condition in some cases of hypopituitarism?

And is not the same true for the relationship of testicular atrophy to certain cases of eunochoidism?

Another case which Stewart cites as an example of the weakness of the clinicians in the diagnosis of suprarenal insufficiency is that of Boyd. This was a soldier who died suddenly although apparently healthy and without Addisonian symptoms, and yet at autopsy extensive tuberculous lesions of the lungs were found! Section showed both adrenals transformed into a caseous substance; in the left one there was a streak of cortical substance preserved, two millimeters thick, and an absence of medullary cells.

Stewart reproves Boyd with having diagnosed postmortem and acute suprarenal insufficiency. As a matter of fact, who does not know that such sudden death in patients with latent grave suprarenal lesions is very common? We have experimentally reproduced this form of latent suprarenal insufficiency, with sudden death (see above). But, according to Stewart, this case could not be diagnosed as acute suprarenal insufficiency, because the symptoms of insufficiency (if there are any characteristic ones, he says) were lacking in life; and the case shows that merely a tiny portion of cortex suffices to maintain a state of apparent health and vigor.

Why then did the patient die? It could be supposed that sudden death occurred when the last medullary cells ceased to function and to lend their aid to the cortical cells, which are incapable themselves alone of sustaining life (see above).

We shall conclude with the plea that, even in endocrinology, laboratory experts convince themselves at last of the necessity of observing and experimenting upon the human patient, from whom have been obtained almost all the most exact knowledge in the field of the physiology of the internal secretions.

As Barker and Sajous in America have rightly noted, it is only by the collaboration of all the branches of biology and medicine, and by the balanced synthesis of all their contributions, that advances can be made in the study of endocrinology.

Following the tradition of the Italian medical schools, according to which one cannot conceive of a clinician who is not also a physiologist and experimental pathologist, we shall continue to have faith in the principle of the great Roman clinician, Guido Baccelli, that "the best laboratory of human experimental physiology is the sick man."

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A Case of Hypopituitarism with Epilepsy*

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In the study of endocrine problems, the rapid success made in the last few years, especially with regard to differentiating certain syndromes, and the varying success in their treatment by either supplying the deficient gland in the case of hypofunction or attempting to antagonize an overactive member of the group, have, it seems to me, been a great factor in interesting the medical profession as a whole in endocrinology, and even converting some confirmed sceptics. Particularly in the field of psychiatry, in the socalled functional disorders, where no definite organic changes have been consistently made out, this at least promises to open a new mode of attack. The danger, obviously, is that we become overenthusiastic and feel that in every unexplainable abnormality or difficult complex, it is simply a matter of *"cherchez la femme"* in the guise of the ductless system. Our knowledge of any but the thyroid and possibly the pituitary glands is extremely limited and lies rather in the field of speculation. The majority of the endocrine disorders appears to be of a pluriglandular nature, one of the glands principally leading the way and soon followed, because of the close interrelationship, by dysfunction of one or more of its fellows.

There are a certain number of cases, however, in which the signs of a dysfunction of one of the glands are so pronounced as to almost completely overshadow the clinical picture. Such a case I have to present, one of deficient secretion of the pituitary gland associated with epilepsy.

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*The above case was presented before the Brooklyn Neurological Society on February 15, 1922.

Cushing, who perhaps knows more about the pituitary, and has done more original work on it in the last few years than any single worker, gives six reasons why pituitary insufficiency is related to epilepsy.

1. Horseley of London noted increased excitability of the motor cortex of hypophysectomized dogs.
2. Epileptiform convulsions were frequently seen in animals, which survived for long periods of time after partial removal of the pituitary.

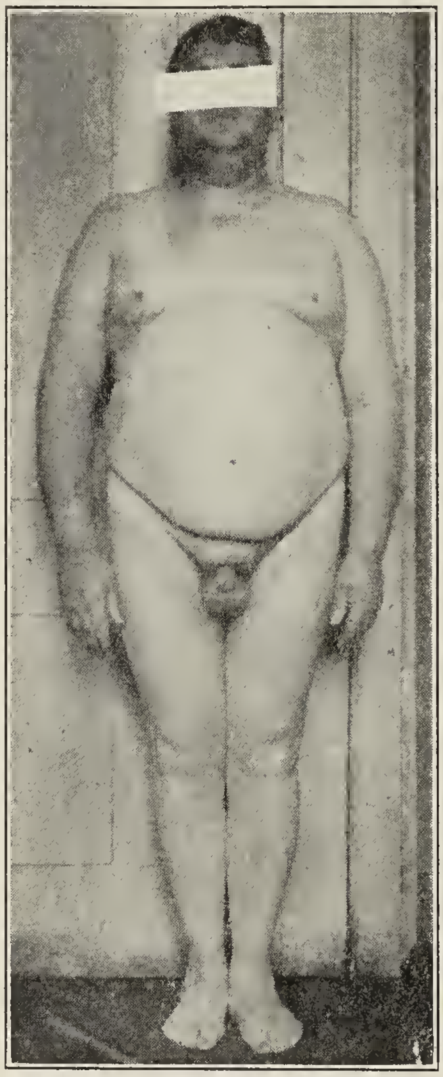

Fig. 1.—Patient on admittance. Note feminine distribution of fat.

3. Epilepsy is a frequent accompaniment of clinical conditions in which insufficiency of the pituitary is manifest.
4. The pituitary may be damaged from a bursting fracture of the skull, where epilepsy follows trauma.
5. It is believed that the posterior lobe secretion enters the cerebrospinal fluid bathing the cortex with a substance essential to the functional stability of the cortical cells.
6. In many epileptics with apparently genuine seizures, presenting hypopituitary symptoms, pituitary extract has modified or decreased the number of seizures.

The patient in question has an interesting history, having had residence at Craig Colony and the Rochester State Hospital before admission.

Case.—He was thirty-six years old; single, a laborer; was born in the United States, and had a common school education, reaching the first primary grade. His father died at fifty-one years of age, of socalled rheumatism. He is said to have been alcoholic, a steady drinker but seldom intoxicated. He was also rather stout. His mother was alive and small in stature. The only other member of the family, his sister, showed no tendency to obesity. The patient was said to have been born at full term, a normal delivery, but was puny. There was no difficulty or delay in dentition, walking or talking. He had diphtheria at the age of six, measles at eight and typhoid fever at twelve, from which time he began to take on in weight. When nineteen years of age he was struck on the head by an iron bucket, receiving a lacerated scalp, which was sutured. The first seizure is said to have occurred nearly a year subsequent to this head injury. Following that they came about every two or three weeks. The patient stated that he had severe headaches immediately before and following the seizures. He also had an aura in the shape of dark clouds before his eyes, became very angry, wanted to tear his clothes and break things. The attacks were accompanied by hysteroid symptoms. During the seizures consciousness was lost and there was amnesia for the period.

He had been employed in various shops as an errand boy. At one time he was arrested for attacking his mother. He had been examined and treated at the Long Island College Hospital, St. Peter's Hospital and Blackwell's Island. On August 13, 1908, he was admitted to the Craig Colony at Sonyea. Physically, there he was described as well nourished, obese, of a feminine type; height five feet three and a half inches and weighed 170 lbs.

Following his admission he was given work in the kitchen. His life there was uneventful until December, 1918, when after some seizures he became confused, ran about, pounded on the floor and walls and broke some windows. Allowed to go to the village some time later, he became intoxicated and used obscene language. Two months later, in April, 1909, he attempted suicide by throwing himself into a pond, but was rescued. During the next few months he had these semihysterical attacks of the same nature, when he would run around the ward, shouting and striking his head against the wall. At times he was violent and quarrelsome. In March, 1912, following a seizure, he jumped through a second story window to the roof of a veranda and then to the ground, clad only in a nightshirt. He disappeared in the darkness and later was found near the district school, about a mile distant, furiously ringing the bell in the belfry and shouting that he was calling the people to the services. He then was rather well behaved until November, 1913, on the evening of which he followed a female employee and attempted to criminally assault her, but was frightened away by the approach of some attendants. A few hours later he was found lying on the railroad tracks in an attempt at suicide. There was some doubt about this, because he was shouting at the top of his voice and attracted the attention of two attendants who were looking for him.

In February, 1914, he passed the Simon-Binet test at a level of ten years, his actual age being twenty-eight. He later confessed to burning a barn the previous August, saying that he had read about the blackhand doing the same thing. That same month he was indicted for assault and was committed to the Rochester State Hospital on February 25, 1914.

At the Rochester State Hospital he was described as simple and childish with episodes of excitement. On June 7, 1921, he escaped and went to the home of his sister, where he had no convulsions until December 9, 1921, and in the excitement following that he was taken to the observation ward.

He was described as always somewhat troublesome and complaining. He was admitted to the Brooklyn State Hospital on December 13, 1921. He had never caused any trouble, had been pleasant and

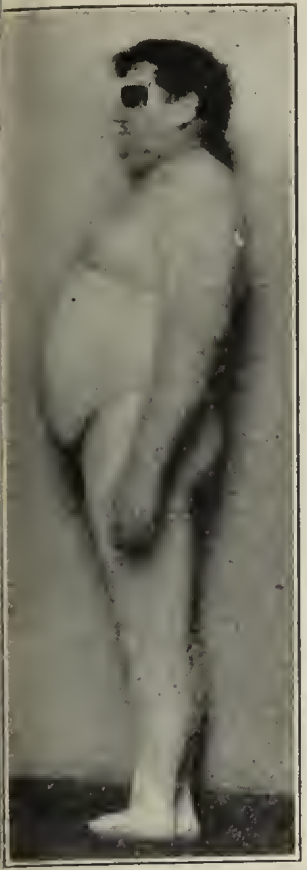

FIG. 2.—Side view of patient.

agreeable but simple and superficial; did quite a bit of work in the wards and had no attack of either *grand* or *petit mal.* Of the epileptic character he has shown some emotional poverty, but no egocentricity or supersensitiveness. A Binet-Simon test showed him to be nine and a half years old mentally. His actual age was thirty-six.

PHYSICAL EXAMINATION.

He was five feet and four inches in height; weighed 230 pounds, very obese with a feminine figure. The fat was distributed, especially at the breasts, shoulders and abdomen. His trunk length was eighteen inches; leg length thirty-three inches, and arm span sixty-eight inches.

The circumference of the head was twenty-three inches, length being eight and a half and width seven inches, making it brachycephalic in type. Its volume was estimated at 1552 c. c. He had an infantile face, normal eyes with an interpupillary distance of two and five eighths inches. Eye movements were normal. There was no diminution in any field. Ophthalmoscopic examination revealed a general lack of nutrition, a thinned out retina and a pale optic nerve, suggesting a beginning atrophy. The glabella, supraorbital ridges and malar eminences were not prominent. The nose was small and straight. Right ear showed a Darwinian tubercle; left ear negative. Both upper and lower jaws were recessive. The palate was low, arched and showed no torus. The teeth were poorly preserved and there was some spacing between the centrals and laterals on both sides in the upper jaw. The right upper 2nd bicuspid and upper 3rd molar were missing. There was no clinical evidence that they were ever present. The lower teeth were crowded. The gums showed a moderate pyorrhea. The neck was short and thick, its circumference being seventeen inches. The thyroid was not palpable.

His spinal column showed a kyphosis at the cervicodorsal region and a lordosis at the lumbosacral region. The thorax was short and wide, having an obtuse subcostal angle. The circumference at the nipple line was forty-six inches on deep inspiration and forty-four inches after deep expiration. The lungs were negative. The abdomen was pendulous and showed striæ. At his waist line he measured forty-five inches. The viscera were negative. The pelvis showed a marked resemblance to the feminine type. The width at the crests was fourteen inches, and at the trochanters sixteen inches. The legs and arms were well rounded and of the feminine type. His hands were rather large, being nine inches around, long and broad with tapering fingers. Genu valgum was present. The feet were narrow, long and toes rather square. Both arches were flat. Muscular development was fair but the tone poor; he fatigued easily. No hyperextensibility, atrophy or paralysis was evident.

His skin was dry, warm and smooth, except on the back of his hands; here it was rough, showed a wrinkling with deep cutaneous furrows surrounding each digit. He perspired moderately in the axillæ, the perineum and on the forehead. His face was ruddy and flushed at times. There was a marked dermatographia. There was some slight pigmentation on the upper extremities. The nails were smooth and brittle. The hair distribution was of fine texture, showing a good growth on the head, but rather sparse over the outer third of the eyebrows. He shaved twice weekly. Axillary hair was scanty and his arms, legs and chest showed a thin distribution. Over the pubis there was a tendency towards the female arrangement.

The cardiovascular system showed nothing striking. Heart tones were of fair quality, clear. No cardiac enlargement or murmurs, the pulmonic second louder than the aortic second. Pulse varied between sixty and eighty, normal reaction to exercise, volume medium, no cyanosis. Blood pressure varied between 140 and 170 systolic—eighty and 110 diastolic. The oculocardiac reflex was normal.

The tonsils were small, some adenoid tissue was present. The thymus was negative to percussion. There was no other glandular enlargement. The sexual organs appeared small, but the testicles were about normal in size and consistency. The scrotum and penis were small. The libido was diminished, but present and he had an occasional erection. The prostate was definitely smaller than normal. The neurological examination was entirely negative. He spoke in a monotone with a childish accent, his voice being rather high pitched. He had frontal headaches with some dizziness and an occasional vomiting spell in the morning. His appetite was increased, especially for meat and sweets. He became drowsy in the afternoon and sometimes fell asleep. He had a nycturia but no polyuria.

One one hundredth gr. of atropine sulphate caused a slight drying of the throat, but no change in his pupils or pulse. After an injection of one twelfth gr. of pilocarpine hydrochloride he complained of increased salivation and some sweating around the eyebrows. There was no change in pulse.

The Goetsch test:—Injection of seven and a half minims of 1:1000 solution of adrenalin caused no change in his pulse, respiration or blood pressure for an hour. Objectively, he merely showed slight tremors of the fingers and tongue. Did not feel nervous in the least.

LABORATORY FINDINGS.

Two daily specimens of urine were absolutely negative with specific gravities of 1.020 and 1.024. Three twenty-four hour specimens, however, showed from one and three fourths to two per cent. sugar. Amounts voided varied from 1110 to 1290 c. c. and specific gravities from 1.032 to 1.036. No albumen, diacetic acid or acetone were present, but there were a few pus cells and an occasional hyaline cast.

In the two hour specimens the specific gravities varied from 1.026 to 1.032. 500 c. c. were voided during the day and this amount contained twenty-six grams of urea.

Phenolphthalein test was 35 per cent. for first hour and 20 per cent. for the second hour.

Two determinations for blood sugar were done. One was 90 milligrams per 100 c. c. of blood. The other was 95 per 100 c. c. Red blood cells 4,800,000 per c. mm., hemoglobin 85 per cent., white blood cells 7,200. Differential: Polymorphonuclear 62 per cent., small lymphocytes 24 per cent., large lymphocytes 11 per cent., basophiles 1 per cent. and transitionals 2 per cent.

The blood Wassermann was negative. No sugar tolerance test was done because of the glycosuria. A blood sugar after ingestion of glucose was not done due to lack of time.

X ray of hands shows increase of soft parts and union of epiphyses. The sella turcica appeared a bit irregular and flattened from above downwards. The greatest anteroposterior distance was 10 m. m. The sella was 5 m. m. deep and there is no space between the clinoids, they being almost in apposition. No evidence was found of an old fracture.

TREATMENT AND COURSE.

He had been getting anterior pituitary extract, two gr. t. i. d. for almost a month. The only improvement shown was his own statement that he was not quite so dizzy at times. No other change had been noted. His temperature ranged from 98.2° to 99°.

Owing to the condition being of such long standing, no great hopes were entertained from organotherapy.

SUMMARY.

The important points that present themselves are:

1. That he began to take on weight after his recovery from typhoid fever.
2. That he received a definite trauma to the head and a year later developed epileptiform convulsions.
3. There has always been some question as to his attacks being genuine epileptic seizures.
4. That he had had no seizures while at the Brooklyn State Hospital.
5. That he has a hypertension and a glycosuria which complicate matters.

To review the characteristic syndrome of hypofunction of the pituitary, we have a relatively short, very obese person with a decidedly feminine figure, a sparse distribution of hair, tapering fingers, underdeveloped genitals, a high pitched voice, who becomes drowsy at times, has a great fondness for sweets, and gives evidence of what appears to be a small sella turcica.

As regards his hypertension, we have not been able to satisfactorily explain it. The possibilities are arteriosclerosis, cardiorenal disease, a concomitant thyroid or adrenal hyperfunction or some toxic condition; none have any evidence to support them.

The glycosuria is evidently not of true diabetic origin; neither is it alimentary; nor can it be explained by disease of the kidney, thyroid or adrenals. There is a possibility of renal diabetes, with lowered threshold for sugar. It is probable, however, that both conditions have the same etiological factor, which as yet we have not determined.

Elgin State Hospital.

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[1] Since that time, the patient has had one seizure of a pseudo-epileptic nature with a decidedly milder reaction.

Preadolescent Gigantism with Precocious Puberty in Brothers*

By NORMAN M. MACNEILL, M.D.,
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History and mythology are filled with accounts of the exploits and accomplishments of fabulous monsters called giants. Many of these accounts are founded on fable, though it is not unlikely that a few represent exaggerations of actual accomplishments by persons whose stature or prowess was great in contrast to that of their contemporaries. The ancients believed that the human race had degenerated from its primeval ancestors who were thought to have been gigantic, and it was not until the nineteenth century, when scientists declared that the supposed remains of human giants were in reality the bones of mastodons and other large animals, that the belief in a vanished race of physical supermen was relinquished. Even the great naturalist Buffon fell into the error of considering certain bones of an elephant those of a human giant. Among the recorded giants of history is the Arabian mentioned by Pliny whose height was nine and a half feet and two others who were over ten feet.

Winkelmier the Austrian giant measured eight feet ten inches. A Scottish giant in the service of Frederick William I of Prussia, measured eight feet three inches. Cujanus, a Swedish giant exhibited in London in 1872, was about nine feet. Capt. Bates and his wife, Anna Swan, natives respectively of Kentucky and Nova Scotia, were both over eight feet in height.

Skeletons in the museums of Trinity College, Dublin, and the College of Surgeons, London, are eight feet six inches, and eight feet two inches respectively. Goliath is reported by Josephus, to have been four cubits and a span (about eight feet nine inches) and Og, King of Basan, said to have been the last of the giants, (Deuteronomy, 3,11) occupied an iron bedstead measuring nine cubits, (about thirteen feet).

It must be remembered that in mythology and folklore, the term giant was often applied to an individual of great speed, strength, prowess or endurance, even if he did not possess great stature or size; a fact which explains the frequent reference to their existence and exploits.

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*Read before the Philadelphia Pediatric Society, June 13, 1922.

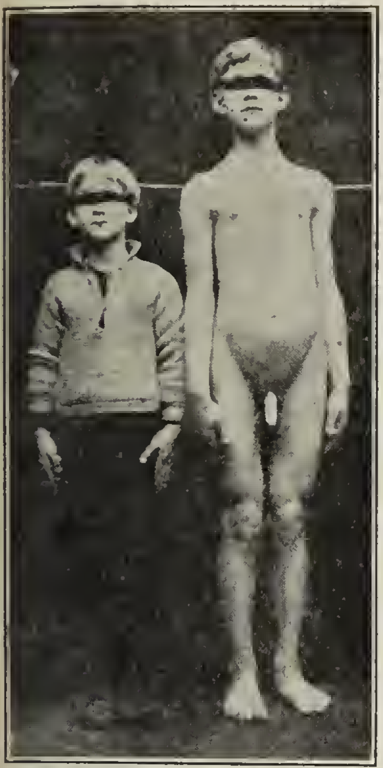

Fig. 1.—The line on the wall represents the average normal height for a boy eight and a half years of age.

An arbitrary classification by Bollinger, places all persons exceeding 205 cm. (six feet ten inches) as giants. This standard may serve as a working rule, though we know from anthropometric studies that there is a mean standard of height in every race, with a few departures in both extremes, and it is not improbable that an occasional individual within, or beyond, Bollinger's standard, may be the normal extreme for his race.

Launois and Roy have given us a more acceptable definition of gigantism as "an anomaly of skeletal growth which leads to a height of the body in excess of the average dimensions of the race and is associated with a characteristic morphological and functional derangement." This of course excludes the socalled "normal giant," a type described by Carl von Langer following his anatomical study of giants in 1872.

Pierre Marie first discussed the pathogenesis of gigantism calling attention to its association with acromegaly, and Biedl defines it as "the acromegaly of those individuals, irrespective of age, whose epiphyseal cartilage has not undergone ossification. This definition is only applicable to those cases of excessive growth due to some malfunction of the pituitary, a condition which is almost invariably associated with an arrested development of the genitalia; the syndrome termed eunuchoid gigantism. Cushing however, says that "illustrative cases of undoubted hyperpituitarism in childhood have been rare and it may be found that premature sexual ripening characterizes this condition."

Tumors of the pineal gland occurring in childhood are accompanied by excessive growth, precocious mental and sexual development and if the lesion is extensive enough, symptoms of brain tumor; particularly those of quadrigeminal lesion. In adults only the neurological signs and symptoms are seen.

Tumors of the suprarenal cortex in childhood may be associated with excessive body growth and premature genital development; a clinical syndrome not dissimilar to that occuring in tumor of the pineal.

Hypergenitalism on the other hand, may be associated with lesions of the pineal, suprarenal or pituitary glands, and is in some cases attributed to primary hyperplasia of the interstitial cells of Leydig.

These abnormalities of skeletal growth and sexual development may be attributable to the malfunction of a particular gland, though the similarity in the syndromes resulting from disease of such widely separated structures as the pituitary, pineal, suprarenal, or interstitial cells of Leydig would make more tenable the assumption that the changes are brought about through an imbalance or disharmony of function in the group of glands rather than in one of them.

The cases which I am presenting, show in association with the abnormal skeletal growth, a precocious onset of puberty.

The patients are brothers, aged eight and a half and seven years. They were born in this country of Lithuanian parents. The maternal grandmother and two maternal aunts were large women. The father was a large bigboned man. He died after five days illness during the influenza epidemic.

The mother is a small frail woman weighing ninety-eight and a half pounds. Height four feet eleven inches.

Case I.—W., aged eight and a half years, was born in normal labor. He weighed nine pounds at birth, was breast fed and had no diseases except pertussis and measles. His height is five feet one and a half inches, weight one hundred pounds. He is of the blond complexion characteristic of his race and has the general appearance of a boy of fifteen years of age. There is no noticeable enlargement of the pneumatic spaces. The facial features are small with a tendency to concavity of profile. There is a suggestion of maxillary prognathism. The mandible seems small in proportion and shallow in depth. The upper teeth are widely spaced. The laryngeal prominence is noticeable. The general body nourishment is poor with no localized deposits of fat. The hands and feet are disproportionately large (shoes size seven). The genitalia show full pubescent development. The pubic hair is well developed with a feminine distribution. There is a good growth of axillary hair and a downy growth of beard. The blood count is normal save for a slight eosinophilia (eight per cent.). The blood sugar findings and sugar tolerance tests were normal. The urine showed a slight trace of albumen. The x ray report showed the sella turcica about average size or slightly smaller than the average with rather prominent clinoid processes. The hands and feet are unusually large with relatively long phalanges. The epiphyses are so developed as to appear like those of a boy of from twelve to fifteen years of age. Examination of the eyegrounds showed no signs of intracranial pressure. The mental development is normal for his age. A suggestion of immaturity or childishness in some of the mental reactions is merely an objective discrepancy between the actual eight year mentality and the physical appearance of a more advanced age.

Case II.—A., aged seven years, was born in normal labor and weighed six pounds three ounces at birth. He was breast fed and had pertussis and measles. His height is four feet three inches. Weight fifty-nine and a half pounds. In physical structure and appearance he resembles his brother. The facial contours are similar. The feet and particularly the hands, are clumsily large. He has the appearance of a boy about ten years of age. The genitalia have undergone pubescent development with a noticeable growth of pubic hair. The blood count shows a low hemoglobin (seventy-two) and sugar findings were normal. The urine showed a trace of albumen. The x ray report is as follows: "the sella turcica is probably smaller than the average for the size of the head. The clinoid processes are larger anteriorly than, posteriorly. There is no irregularity in the floor. The bones of the arms and hands, legs and feet, are relatively larger and the epiphyses are developed so that they look like those of a child from twelve to fifteen years of age. We believe that there has been at some time, if not at present, increased intracranial pressure. The convolutional depressions are more pronounced than normal and there is slight separation of the coronal sutures."

The eyeground examination shows no signs of intracranial pressure. The mental development is normal for his age. In conclusion I wish to emphasize the followings points:

1. The abnormal skeletal growth of thirteen and a half inches above the average height for his age, in a boy eight and a half years old and six inches above the average in a boy of seven years.
2. The precocious onset of puberty in association with the abnormal skeletal growth.
3. The normal mental development according to age.
4. The occurrence of the condition in brothers with the suggestion of an hereditary component.

In view of the positive findings and in the absence of symptoms suggesting involvement of other glands, it seems safe to assume that the condition is due to a hyperfunction of the anterior lobe of the pituitary gland.

X Ray Therapy of the Thyroid Gland*

By JOHN G. WILLIAMS, M.D.,

Brooklyn.

Our knowledge of the physiology of the thyroid gland is like that of many others of the ductless glands, somewhat incomplete. We know that congenital deficiency of the thyroid results in failure of physical and mental development, which condition is known as cretinism. When this deficiency begins in adult life there results a group of symptoms such as mental and physical sluggishness with edema and reduction of basal metabolism, and we designate this syndrome as myxedema or hypothyroidism.

The active principle of thyroid secretion is an iodine compound. According to Marine the iodine is stored in the gland in two forms. The physiological active hormone is stored in the colloid of the gland, while the inactive iodine collected from the blood is stored in the cells to be elaborated into the active form as needed.

In mammals it has been shown that the normal thyroid contains on an average 0.2 per cent. of iodine with extremes of 0.1 and 0.5 per cent. It has also been demonstrated that, whenever the store of iodine falls below 0.1 per cent., active hypertrophic and hyperplastic changes in the thyroid take place. This iodine store in the gland may be rapidly increased by the administration of iodine in almost any form, and as a result of this, hypertrophic and hyperplastic glands in the young rapidly undergo involution with return of thyroid cells to normal or nearly so.

Kimball and Marine, applying Marine's observations on the rôle of iodine in goitre prevention, in known goitre districts, demonstrated that the administration of small doses of iodine to school children of these districts markedly reduced the incidence of thyroid enlargement in adolescents, and reduced the size of the gland in those already affected.

Kendall isolated the active iodine compound of the thyroid which he called thyroxin. This compound when administered to patients with myxedema has the same physiological effects as desiccated thyroid gland. Plummer has shown that the intravenous administration of ten mg. thyroxin to a patient with myxedema elevates the basal metabolism rate twenty-eight points. The maximum elevation is reached five to ten days after administration and does not return to previous rate until thirty to forty days later. Clinically he has determined that the daily administration of 1.6 mg. thyroxin is the average requirement of an ordinary case of myxedema.

Cannon and Smith have shown that stimulation of cervical sympathetic causes increase secretion of thyroid. Severing the nerves to the gland apparently causes no serious disturbance and he believes that the nerves serve emergency function to the gland in times of stress.

Marine sums up the function of the thyroid in the following way: "The thyroid has to do in some important way with internal respiration, or the utilization of oxygen by the tissues. Indeed this is the only known function of the thyroid."

We may classify goitres as simple, cystic, colloidal, adenoma, exophthalmic, and malignant.

Of these the adenomata with hyperthyroid symptoms, the exophthalmic and malignant cases are suitable for x ray therapy. It would seem to be proper to classify the toxic adenomata and exophthalmic goitres as cases of hyperthyroidism.

Advanced cases of hyperthyroidism are so characteristic that the diagnosis is not difficult. In certain cases, however, in addition to the history and physical examination it is necessary to resort to a determination of the basal metabolism or Goetsch test for diagnostic purposes. Usually a basal metabolic rate in excess of plus fifteen is found in hyperthyroidism. The metabolism test is a valuable aid in determining the progress of the case while under treatment. R. S. Dinsmore, in a recent work on the thyroid gland by G. W. Crile and associates, sums up the results of the Goetsch test in this clinic as follows: 1. "The Goetsch test has been of distinct value to us in the differentiation of borderline cases of hyperthyroidism. 2. Eighty-nine per cent. of the patients with clinical symptoms of hyperthyroidism give a positive reaction to adrenalin. 3. In about eighty-five per cent. of the cases the results of the Goetsch test are in agreement with the metabolism estimations. (Basal metabolism estimations themselves are distinctly less than one hundred per cent. accurate.)"

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*Presented before the Society of Internal Medicine, Brooklyn, New York, October 27, 1922.

The x ray treatment of hyperthyroidism dates back many years. In the early days of this treatment these cases were usually treated by fractional doses, usually with no filtration and frequently with no accurate measurement of dosage. Obviously under such conditions there were frequently severe reactions of the skin induced, accompanied by the immediate symptoms incident to such injuries and later followed by permanent changes in the damaged skin, such as telangiectasis, atrophy and other sequellæ. Naturally as a result of these injuries, this method of treatment did not become popular. However, with the development of more accurate determination of dose, and the advent of filtration and the invention of the Coolidge tube, this branch of x ray therapy was again taken up and in recent years a large number of papers on this subject have been published.

It has long been known that in many cases of hyperthyroidism there is also hypertrophy of the thymus gland. According to Blackford and Freleigh of the Mayo Clinic, all patients under forty years show enlarged thymus and about fifty per cent. of those over forty show this condition. Because of age incidence they conclude that the presence of enlarged thymus in these cases is due to toxic condition incident to the goitre which stimulates hypertrophy of vestigial remnants of this gland. Because of the common association of enlarged thymus in these cases Halstead tried the x ray treatment of the thymus and in 1916 reported in the *Johns Hopkins Hospital Bulletin* satisfactory results. In his cases treatment was administered to anterior mediastinum, but no treatment was given over the thyroid area. Pfahler and Zulick in 1916 in a comprehensive review of the literature and based on their experience conclude that "no case of Basedow's disease should be operated on until there has been a trial of röntgen treatment. If the indications call for operation later, the patient will be in a better condition for the operation after the treatment than before. They advise treatment to both thyroid and thymus regions.

G. W. Grier in 1917 concluded that in mild cases of hyperthyroidism rest or x ray treatment were indicated and surgery contraindicated. In acute exophthalmic goitre x ray treatment is the most satisfactory. Surgery is unnecessary and dangerous. In long standing cases the choice lies between x ray treatment and surgery. The x ray treatment is apt to be slow but there is no mortality and less danger of subsequent recurrence.

J. A. Lichty says that eighty per cent. of cases of exophthalmic goitre can be symptomatically cured by radiation and also advises preoperative treatment where operation is contemplated and postoperative treatment in recurrences after operation.

Holmes and Merrill in 1919 reported results of treatment in 262 cases. In 1921 they reported on 107 additional cases. Their conclusions are that colloidal, cystic and simple goitres should never be rayed. Malignant disease should be treated surgically and receive postoperative raying. Toxic adenomata respond readily to x rays but surgery is quicker and mortality in these cases is low.

Nontoxic adenomata are treated surgically if at all. None of these have been rayed. Exophthalmic goitres are usually started on rest and radiation. Even if surgery is contemplated preliminary rest and radiation reduces the operative risk. As a matter of fact a large percentage of cases never come to operation.

A. F. Tyler, of Omaha, in a paper before the American Röntgen Ray Society, speaking of the advantages of x ray therapy of toxic goitre over other methods, says that first, there is no mortality due to treatment; second, it is useful in surgical failures; third, it can be employed in operable cases.

A. H. Soiland, of Los Angeles, sums up his experience in treatment of two hundred cases of toxic goitre as follows: "It is not the intention of the writer to decry surgery or detract one iota from the many brilliant results obtained by competent operators, but the fact must not be lost sight of that in radiation we have a proved therapeutic agent, far superior to any other given us up to the present time."

R. G. Allison, A. H. Beard, and G. A. McKinley report on work in the x ray laboratory of the medical department, University of Minnesota: "The cases were classified in three groups; first, those exophthalmic cases receiving only x ray treatment; second, postoperative cases with persistant symptoms; and, third, three cases of toxic adenoma." A large number of their cases were checked up by metabolism tests. They summarize the results in graphic charts. In the cases receiving only x ray treatment the average metabolism rate before treatment was plus thirty-two and after treatment plus nine. In the postoperative cases before x ray treatment the average was plus twenty-eight and after treatment plus twelve. The toxic adenomata consisted of only three cases which showed little change.

Seymour summarizes the advantages of x ray therapy of hyperthyroidism as follows:

> There are no fatalities. There is no resulting scar as after operation. It does not interfere with the patient's occupation except in severe cases. It is painless and causes very little inconvenience to the patient. If unsuccessful, an operation may be performed with less work because of the favorable action of the x ray on the thymus gland.

Florence Story in 1913 reported forty-eight cases of hyperthyroidism treated with x ray. Of these fourteen were cured, twenty-two improved, four unimproved and seven did not continue treatment.

Probably the largest group of cases reported on in which there were careful metabolism studies made is that reported by Means and Aub. The basal metabolism in those treated with x rays averages plus sixty-three, whereas in those treated surgically the average before operation was plus forty-six. Therefore those treated with x rays showed higher degree of toxicity. The basal metabolism in those treated surgically dropped sooner than those treated with the x rays. This early drop in the surgical cases was, however, soon followed by a rise in the rate. Tests of both groups at the end of three years showed the same results, each group averaging plus thirteen per cent. Of nine deaths in fifty-five cases five were due to surgery. One died during x ray treatment of exophthalmic goitre. Three died of unknown causes. Their conclusions are as follows:

1. Results are equally good with surgery or x rays after two to three years.

2. After surgery the metabolism shows a rapid preliminary fall, a second rise followed by a final fall. That with röntgen ray treatment there is a gradual progressive fall.

3. That in securing the same results with surgery or röntgen rays a lesser rest factor is necessary with x ray treatment. With x rays there is no mortality; with surgery there is a definite mortality.

4. That patients treated surgically do better and the risk of operation is less if they have previously had their thyroid and thymus glands irradiated.

5. That risk of operation is greater and need for preoperative röntgen ray treatment is greater in cases with a very high metabolism and moderate tachycardia, than in those with extreme tachycardia and moderate metabolism elevation.

6. That the safest program for the treatment of exophthalmic goitre as a whole is the röntgen irradiation of the thyroid and thymus glands in all cases, with surgery reserved for those who do not do well.

7. That surgery is contraindicated with patients whose metabolism is rising in spite of complete rest in bed and also with patients of the type with moderate tachycardia and great metabolism increase except when they have previously had thyroid and thymus glands treated by röntgen ray.

Most of the opposition to x ray treatment of hyperthyroidism is voiced by the surgeon. C. H. Mayo, in a paper before the Clinical Congress of American Surgeons in Montreal in 1920, said: "With x ray treatment remission may occur just as remissions occur without treatment or with several other methods of treatment. Our experience has been failure or but temporary benefit. It is possible that the ray treatment may destroy the gland and produce hypothyroidism. It is difficult to regulate the dosage and its use adds to the difficulty of operation. It is to be hoped that radiotherapy may be developed into a safe and effective method of securing a cure or relief in preparation for surgery." His conclusions concerning results of x ray therapy differ so materially from the many röntgenologists and internists reporting on this subject that they are not to be reconciled. Apropos of the production of hypothyroidism by x ray therapy, he mentions the study of one hundred cases of myxedema and hypothyroidism in this same paper and ascribes the causes to thyroiditis, inactivity of the gland and surgical excess. He makes no specific mention of x ray therapy as a cause.

Crile in a paper published in 1921 quotes various authors who favor or oppose x ray therapy in hyperthyroidism. He says that the operative risk under this type of surgical management may be largely disregarded, yet Mayo in his paper while not giving definite mortality statistics, says the death rate may vary from 0 to four per cent. in groups of one hundred. Crile alludes to the danger of x ray burns and the possibility of damage to the parathyroids. Burns in these cases are possible, just as death from hemorrhage is possible in the surgical treatment, but neither of these accidents should occur. I am unable to find any reports of damage to the parathyroids through x ray therapy, though there are many reported due to surgery. Concerning the danger of myxedema from x ray therapy the following quotation is from a chapter by C. D. Christie in a recent book: "Most of the adult cases of myxedema which we have encountered have followed thyroidectomy. We have, however, encountered myxedema in patients on whom thyroidectomy has not been performed." In the same chapter Christie says: "The tabulations serve to emphasize the fact that rest and exposure to the x ray, ligation and thyroidectomy are all very potent factors in reducing heightened metabolism, the basic symptom of exophthalmic goitre, and therefore favorably affect the course of the disease. It will be found that the pulse rate represents a fairly accurate index to the metabolic rate."

I have in the past treated hundreds of cases of cervical adenitis and cancer of the breast in which the thyroid region was incidentally subject to radiation and yet I have never known of a case of myxedema following these treatments. It would therefore appear that there is no great danger of hypothyroidism following radiation. Holmes and Merrill in their large series report one case of myxedema. S. G. Burnett reports a case of myxedema following radiation, but there was nothing in the history of this case as given to warrant the use of the x rays, there being practically no evidence of hyperthyroidism.

The x rays in hyperthyroidism apparently act by causing atrophy and diminished activity of the epithelium of the vesicles. E. Goetsch and C. A. Waters in some experimental work on dogs demonstrated that after intense x ray exposures there resulted changes in the thyroid varying from moderate atrophy to almost complete destruction of secretory power of the gland. The treatments given in these experiments were, however, several times more than a safe dose in human beings. There was sloughing of the skin at the time the dogs were killed. The technic as used by me has been to treat the thyroid and thymus areas on each side separately, using four mm. of aluminum as a filter—nine inch spark-gap at a distance of nine inches for six minutes to each area. Latterly where the tonsils show marked hypertrophy and evidence of disease, I have included them in the area to be treated, extending the distance to twelve inches and time to nine and one half minutes. The second treatment is given three weeks later and the third treatment four weeks after the second, the interval between treatments being extended one week longer than each preceding interval. In this way I believe there is no danger of giving too much treatment. This is not a routine treatment for all cases, as the cases vary in their degree of toxicity and the amount of treatment given varies accordingly.

Only rarely have I noticed much change in the patient's condition three weeks after the first treatment. Plummer's finding that the effects of a single dose of thyroxin continues for thirty to forty days after administration I believe explains the delayed response to treatment. Usually at the third visit seven weeks after the first treatment there is noted a slowing of the pulse rate and an amelioration of the nervous symptoms. After this the patient begins to regain some of the previous loss in weight. The eye symptoms and the goitre are last to show improvement and frequently do not wholly disappear. The number of treatments necessary varies from three to nine with an average of about five. Cases treated by me since 1916 vary from mild hyperthyroidism to intensely toxic cases. Fifteen per cent. of cases treated have previously had surgery with persistence of symptoms. These have generally improved under treatment. One case recently treated by me discontinued treatment unimproved after three treatments. Four years previously he had had a double ligation. He had no visible or palpable enlargement of the thyroid nor did x ray films show any evidence of intrathoracic goitre. He was actively engaged in business during treatment, and I believe he would have shown some improvement could he have rested while under treatment. A considerable number of cases treated by me have been able to follow their usual vocations while under treatment. However, I believe that rest and freedom from worry and excitement when possible, together with medicinal treatment if necessary, are necessary concomitants of x ray therapy. Highly toxic cases should have rest in bed to prevent damage to the myocardium.

Very little has been written on the x ray treatment of malignant disease of the thyroid. Pfahler in a paper before the American Röntgen Ray Society in 1921, reports a series of cases, some of which had been operated on and were referred for postoperative therapy; the balance of the cases were tumors of the thyroid, some of which were proven by microscopic section, but in others the diagnosis was based only on the history and clinical findings. In general the results showed disappearance of primary tumors or local recurrence. Where metastases had taken place before treatment was begun, there was little response to treatment, and sometimes metastases appeared in remote parts after treatment was discontinued. Richards of Toronto in discussing this paper reported favorable results in two cases of carcinoma proved microscopically.

Crile reports an inoperable case of carcinoma in which, following division of the preglandular muscles to relieve pressure, symptoms entirely disappeared under x ray therapy. Five months later the patient was apparently well except for symptoms of myxedema due to destruction of gland by the growth. My own experience in those cases has been limited to postoperative therapy. One case with extensive involvement of cervical glands showed marked improvement but discontinued treatment because of röntgen sickness induced by treatments and has not been traced. Sufficient time has not elapsed in the other cases to determine final results.

All cases of hyperthyroidism should be treated with rest and x ray therapy.

Those cases not completely cured are better surgical risks after this treatment.

X ray therapy is indicated where symptoms persist after surgery with prospect of relief.

In malignant disease of the thyroid surgery is indicated when complete removal of growth seems possible, to be followed by prophylactic radiation. If inoperable, intensive x ray therapy offers probability of some relief and possibility of cure.

The author's references will appear in his reprints.

Congenital Total Hemihypertrophy*

By ALFRED C. REED, M.D.,
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The recent report by Stanton and Tuft (1) of a case of this interesting and unusual condition prompts me to record a similar case seen in the medical service of the Stanford University Medical School in the fall of 1919. In a thorough review of the literature, these authors find a total of only forty-one reported cases, theirs being the forty-second. It is unnecessary to repeat the material they have given on the literature, rarity and pathology of congenital total hemihypertrophy.

CASE.—Miss M. P., aged fifteen and one-half years, an American born girl of Italian parentage, came to the Stanford Medical Clinics for tonsillectomy. In the course of the routine examination for anesthesia, attention was directed to the marked disproportion in size in the two sides of her body. Her right foot, leg, thigh, pelvis, abdomen, breast and upper extremity were considerably larger than the corresponding parts on the left side. There was a disproportion in the shape of the head and face with a considerably wider palpebral fissure on the right but the actual measurements were the same on both sides.

Her father was a syphilitic, who had a Neisser infection, both diseases, however, being contracted after the birth of his two children. The mother was subject to asthmatic bronchitis and had extensive nasal accessory infections. The patient has one brother two years younger than herself, well and entirely normal. All of the grandparents lived to an advanced age and there was no history in the family of congenital structural anomaly.

The patient had been healthy and robust, was born at term and developed normally. She had had diphtheria. She never had headaches, nor was there a history of any injury or accident. For some time the glands in her neck had been swollen. She had never had earache or an ear discharge. Hearing had always been acute. She had had frequent moderate sore throats and for that reason wished to have her tonsils removed. She was not constipated and never suffered any irregularity in the respiratory, cardiac or digestive systems. Menstruation began at the age of eleven and had been normal and regular. She was born and had always lived in California. Her present illness and complaint related solely to her tonsils. The asymmetry of her body was noted on the occasion of examination for anesthesia.

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*From the Department of Medicine, Stanford University Medical School.

Examination showed a well-developed and well-nourished girl weighing 110 pounds, of bright and intelligent demeanor and no appearance of ill health. The special senses and sense organs were normal. The teeth were excellent, tonsils hypertrophied, cervical glands palpable. The heart was in normal position and presented no abnormality. Lungs were clear. The breasts were unusually heavy, hypertrophic, pendulous, and the right breast was considerably larger and hung lower than the left. The abdomen was asymmetrical, no abnormality found. The right arm and forearm were one-half inch greater in circumference than the left. The right foot was of the same length and breadth as the left, but the foot, the calf and the thigh were one inch greater in circumference. The disproportion was striking.

The skin showed peculiar lesions limited to right side of body, which Dr. H. E. Alderson, professor of dermatology in the Stanford Medical School, described as diffuse areas of passive congestion, mostly on the outer aspect of the right leg, thigh, buttock, lumbar and scapular regions. According to the patient these areas did not vary in location but did vary in intensity. At times the redness or bluish tinge would be deeper than customary. The localized unilateral and extensive distribution of these lesions suggested an origin in some central nervous influence affecting the vasodilators.

X ray examination of the skull showed a sella of normal size and with its floor clearly outlined, and no radiographic abnormality of the skull.

Blood pressure was equal in the two arms and averaged 105/75. Pulse averaged 76. Temperature was normal. Blood Wassermann was negative. Blood count showed 4,440,000 red cells, 85 per cent hemoglobin, 7100 leucocytes with 60 per cent. polynuclears, 34 per cent lymphocytes, 2 large mononuclears, 2 eosinophiles and 2 transitional cells. The urine and blood sugar tolerance were normal.

In summary, no clew to the cause of the one-sided hypertrophy could be found. It was evidently on a congenital basis and there was no definite evidence of endocrine unbalance or asymmetry of the vascular system. The peculiar skin lesions raise the possibility of increased blood supply to the right half of the body but it is only a supposition.

Reference:

1. Jour. A. M. A., lxxx, 20, 1432, May 19, 1923.

The Newer Aspects of Röntgenotherapy*

By CHARLES EASTMOND, A.B., M.D., F.A.C.P.,

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In any consideration of new methods, it is advisable to review briefly the old, and to take stock of what has already been accomplished. This holds especially true of röntgenotherapy.

It is to be remembered that, in a general way, the x ray is an irritant. Mild irritation from any cause provokes stimulation; excessive irritation, or overstimulation, always produces destruction. The physiological action of the ray, or the rationale of röntgenotherapy, constitutes this very effect—stimulation of such tissues as may require an alteration of the local metabolism of the cells, or destruction of pathological tissue, whether it be superficial or deep.

The conditions in which röntgenotherapy is applicable divide themselves into three groups, in accordance with their accessibility or their more ready response to irradition: The superficial lesions of the skin; glandular system; deeper structures.

Röntgenologically, superficial lesions are those dermatological conditions which are benefited, if not entirely cured, by the proper application of the x ray.

Before considering the individual conditions in which this therapy is indicated, certain peculiarities must be taken into account. Skin susceptibility varies with age, sex, color, and the part of the body exposed, and the technic must be modified accordingly. Superficial action and reaction are also intensified by certain chemicals, such as iodine, chrysarobin, sulphur, mercury, tar and salicylic acid. Accordingly, if any of these agents has been employed prior to irradiation, the greatest care must be exercised to avoid an undesirable dermatitis.

From the röntgenotherapeutic viewpoint, dermatological conditions are divided into certain groups, in accordance with the nature of the pathology, and the change to be effected.

a. Those conditions in which it is desired to produce a change in the local metabolism of the cells. The most common conditions in this group are acne, eczema and psoriasis.

Acne.—The types most favorable to irradiation are the indurated and pustular forms which respond readily and offer most brilliant results. However, even the simple, acute pimples of the growing girl may be eliminated. The acne which appears only at the menstrual period does not respond well to radiation, but this is usually effectively treated by other means.

Eczema.—Eczema of the chronic type is almost invariably relieved, with complete restoration of the skin to its normal condition.

Psoriasis.—This lesion is always resistant to chemical treatment, and irradiation alone brings about only temporary relief. A series of x ray treatments, followed by the use of chrysarobin, is frequently the most effective means.

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*Read before the Brooklyn Medical Society, December 15, 1922.

2. The second group is comprised of those conditions in which there is infection of the hair follicles. Here, epilation is indicated, not only to remove the infected hair, but also to permit complete drainage of the hair follicles.

Folliculitis, ringworm, and sycosis.—These are the most prominent types of hair follicle infection, and the loss of the hair—incident to the action of the ray—will usually cure the condition. While alopecia is thus produced, the baldness is only temporary, and, as a rule, the hair returns in increased quantity within three months.

3. The third group includes those conditions necessitating the destruction of tissue.

Verruca vulgaris.—Verruca vulgaris or the common wart, together with callosities, is readily destroyed, disappearing often after a single application.

Keloid.—Röntgenologically, this may be considered to be of two types. The first, the traumatic, occurs after burns or scalds, and is amenable to treatment. The second, or surgical, is present when there is excessive cicatricial formation at the site of an operative wound. The latter is more resistant, but when such scar tissue interferes with the function of a joint, sufficient diminution can be accomplished, so that joint function is increased to the point of usefulness. Of particular importance, in keloidal conditions, is the relief from pain when it is present.

Lupus.—In lupus where destruction of the affected tissue is the end to be attained, the results are good.

Rhinoscleroma.—While unusual, rhinoscleroma must be included because the x ray is practically a specific in this condition, and the outcome is far superior to that obtainable by any other method.

The spleen and lymphoid structures are very susceptible to radiation and consequently, in disease of these structures, röntgenotherapy is the advisable procedure. The most common splenic conditions are splenomyelogenous leucemia and the splenic enlargements associated with certain forms of anemia, including Banti's disease. In none of these conditions s a permanent cure effected, but life is prolonged for two to five years.

The best results are obtainable only when there s the closest cooperation between the röntgenologist and the attending physician. The importance of this cooperation is readily appreciated when one considers hat the physician must observe his patient closely for he earliest sign of relapse, in order that further reatment may be instituted; and must report the paient's systemic reaction to treatment, so that the dose may not exceed the point of tolerance.

Hodgkin's disease.—As an affection primarily of he lymphoid structures, Hodgkin's disease offers the strongest indications for röntgenotherapy. Treatment of each affected area, including the mediastinal glands when they are involved, prolongs life—as with splenic conditions—for from two to five years. Reapses are frequent, and again, as in splenic condiions, the patient must report frequently.

Tuberculous glands.—Even in the early days, with he crudest of technic, tuberculous glands were reduced in size, and röntgenotherapy is still the procedure of choice. The results in these cases are extremely satisfactory, and the patient is spared an unsightly operative scar. If the glands break down, a simple puncture for drainage is sufficient when the x ray is used.

Thyroid.—As this is a glandular structure, it is also in this class. In thyroid cases, their order of response to the ray is important: 1, the exophthalmic; 2, the toxic, and 3, the cystic.

When the thyroid is being treated by röntgenotherapy, the joint observation of the röntgenologist and the attending physician should continue for at least six months. On the part of the physician, this observation will consist of a careful record of the pulse, weight and basal metabolism rate. Complete abolition of the tumor mass may not be accomplished, but the relief of the exophthalmos, the diminution of the pulse rate, the diminution of the basal metabolism, and the increase in weight, all will indicate that the patient's condition has been ameliorated.

It is of especial interest that the newer technic, permissible with the high voltage apparatus, materially shortens the course of the treatment, so that the patient may now receive, within two weeks, an amount of irradiation which was formerly possible only over a long period of time.

Tonsil.—Being also lymphoid tissue, the tonsil must receive consideration. Theoretically, irradiation should bring about a rapid destruction of the glandular tissue, so that practically nothing but the stromal elements would remain. Brilliant results have been reported by some, while others who are equally reputable as röntgenologists and equally careful as observers, have failed to attain the same ends.

It is my opinion that the röntgen treatment of tonsils should be limited to children, and, possibly, to those adults who are considered unsatisfactory surgical risks. Sufficient time has not yet elapsed to determine the permanence of the results.

Ovaries.—The effect of the x ray upon the ovaries is most profound. By careful regulation of the dose, mere diminution of the ovarian function is effected; while, with large doses, all functioning can be completely terminated, and a true menopause produced.

There are a number of women in whom abnormal ovarian function manifests itself by an excessive menstrual flow. The menorrhagia referred to usually occurs before thirty, and I have observed it in a girl as young as nineteen. These cases are to be differentiated, however, from the ovarian disturbances incident to the menopause. The excessive menstrual flow (menorrhagia) is readily controllable, so that there is a return of the periods to normal. However, in those women who are approaching the time of the menopause and who are suffering from uterine hemorrhage, metrorrhagic in character, a permanent cessation of ovarian function is effected, with practically no disability to the patient. The presence of a fibroid is an indication for, rather than a contraindication to, röntgenotherapy.

Uterine fibroids.—With the exception of those cases in which the physician may be reasonably certain that the growth is pedunculated and intrauterine, or in the presence of a single mass which may be removed without disturbing the integrity of the uterus as a whole, the surgical treatment of fibroids, during the child bearing period, is unwarranted. Not only is there no occasion, but there is no excuse, at the present day, for the removal of a uterus merely because fibroids are present.

For over ten years, even with inefficient apparatus, as therapeutic apparatus is now rated, patients have been wholly relieved of fibroids and restored to complete health, with less physical discomfort than that associated with a simple anesthetic. With modern apparatus of the high voltage type, sufficient irradiation may be given, within three to four consecutive days, to abolish the tumor, and to produce, after a lapse of a few weeks, a uterus which is perfectly normal in form, mobility and size.

It has previously been considered, and is even now maintained by many, that the retrogression of the fibroid is due merely to the production of the menopause through the cessation of ovarian function. This is the teaching of the German school. However, it is common knowledge that many fibroids persist after the cessation of menstruation, and some even develop after that time. It must, therefore, be considered that, in addition to whatever changes may be brought about through the production of a menopause, there is a direct action upon the growth itself, as maintained by Beclere and his followers.

The röntgen treatment of fibroids is by far preferable to the surgical procedure, because:

a. There is absolutely no mortality.

b. The shock is relatively slight, and is entirely recovered from within a few days.

c. There is no anesthesia risk. While this is small, it must be considered when one undertakes a major surgical procedure.

d. The psychic effect produced upon the patient when she realizes that there will be no loss of a body organ, but merely its restoration to the normal.

It is to be noted, however, that adnexal inflammatory conditions contraindicate röntgenotherapy for the control of ovarian function or for the abolition of uterine fibroids.

Carcinoma.—A consideration of röntgenotherapy in connection with the cancer question includes the entire gamut of malignancy from the superficial basal cell epithelioma to the extensive primary or recurrent intraabdominal growth.

It is recognized that the nearer body cells approximate embryonal tissue, the greater is their reaction to radiation. Therefore, malignant tissue, being embryonal in type, lends itself readily to removal by this means. There is absolutely no question but that the rays will effect an elimination of malignant tissue, as it is necessary only to introduce the requisite amount of ray into the affected part.

It has been erroneously asserted that the rays tend to promote the growth of preexisting malignancy, and that, under irradiation, tumors will enlarge. Dr. James Ewing, of New York, who has studied extensively the subject of the rays and cancer, denies absolutely such a possibility. The enlargement of cervical glands, etc., is merely a primary inflammatory reaction, such as ensues after the exposure of normal tissue.

The socalled "lethal dose" has been considered essential for the elimination of malignant tissue. However, it is advisable to set aside the older term, in favor of the new "optimum dose." In one of the New York hospitals where much time has been devoted to the irradiation of the deeper structures, the early idea of introducing a maximum amount of ray was followed by poor results and even by death, because of the false impression that the more ray introduced into the tissue the more rapid the destruction and the quicker the recovery. Further experience has demonstrated that, with proper technic, what is spoken of as the optimum dose may be administered with the best results, and, with such technic, the systemic reaction need not exceed the patient's tolerance.

How does radiation destroy malignancy? The question is a natural and pertinent one. In the presence of superficial lesions, it has been considered that there was brought about a necrosis of the malignant tissue, with its replacement by a normal or scar formation. Recent work by Ewing has shown that, in regard to tumor cells, there is usually excess pigmentation of their nuclei, together with an anemia of the cells themselves, followed by atrophy. During this process, there is a more important change—that of increased activity of the surrounding cells, the advance of leucocytes and lymphocytes, and the proliferation of the capillaries, all of which invade and replace the tumor mass.

In deep carcinoma, the destruction is not brought about by a direct killing of the tumor tissue, but the necrosis is due to occlusion of the delicate bloodvessels, leading to an infarction, and thus, secondarily bringing about death of the tissues. The broken down cells are then absorbed and eliminated by the body. As Ewing well states, "Direct killing of tumor tissue cells is probably never accomplished by external radiation. It is an important law of pathology that necrosis of tissue cells usually results from failure of circulation."

It is not necessary to consider the divers forms of malignancy in their special localities. Practically all malignancy is amenable to röntgen treatment and the results are better than those obtained through any other method. Amelioration is the word at present, rather than cure.

For years röntgenologists have been advocating the use of the ray following the removal of malignant masses, especially those of the breast, as a prophylactic against recurrence. This is of the greatest importance and should be instituted as soon after operation as is possible. It is not necessary to wait for the surgical incision to be completely closed before starting the treatment. However, if postoperative raying is of importance, as has been demonstrated for so many years, preoperative treatment is of even greater importance. The rationale of such a procedure, especially in breast cases, is to block all the lymphatics, in order to limit at the time of operation the possibility of extension, by the passage of malignant cells into the blood stream or lymphatics, with consequent metastases. Often, the breast which has been subjected to preoperative irradiation escapes removal because of the marked recession of the growth.

The question of biopsy has been discussed extensively. It is seldom appreciated that a doubtful tumor may be so irradiated that biopsy will be rendered a safe procedure, and yet the alteration of the tissue will not be so great as to interfere with the pathologist's recognition of the nature of the growth.

In connection with the cancer question, one important point must be borne in mind. The patient in whom cachexia has begun to appear is so overwhelmed with malignancy that nothing will be of any avail, and, if a beneficial effect is to be obtained, treatment must be given before cachexia appears.

Modern methods and high voltage machines have been mentioned. By modern methods is meant a careful plotting out on cross section charts of the location of the lesion to be treated, estimating mathematically the depth from the surface in the case of an internal growth, and considering the best avenues of approach for irradiation. This is done with great accuracy, and, from such a chart, the röntgenotherapeutist estimates how the optimum dose may be administered to the desired point beneath the surface, without injury to the skin.

Modern methods of treatment, especially in deep malignancy, necessitate the use of rays produced by an apparatus which will deliver at least 200,000 volts.

It is generally accepted that the most effective rays for therapeutic purposes are the gamma rays of radium. So far as the physicists can tell us, x rays, produced by a high voltage machine, properly filtered, are identical with the gamma rays of radium. When one considers that it would require from two to three grams of radium on the surface to produce an amount of ray equivalent to that obtainable through the high voltage machine, the superiority of x radiation is apparent.

1. The successful treatment of any pathological lesion by röntgenotherapy is dependent upon the introduction into the tissue of such a quantity of the ray as will produce the desired effect.

2. The destruction of deep pathological tissue by high voltage radiation is a major procedure. There must be definite preparation of the patient before the institution of such treatment, and, following the treatments, the aftercare under the cooperative supervision of the röntgenologist and the attending physician is of the greatest importance for the comfort and welfare of the patient.

3. With modern high voltage machines, the patient receives irradiation of the same quality as the most desirable rays of radium, and in a volume which cannot be obtained from radium because of the large quantity necessary.

4. High voltage röntgenotherapy, in competent hands, is doing more for the relief of malignancy and certain other types of tumor than any other means which has yet been placed at the disposal of the physician. Furthermore, this method of treatment is effective even after surgical failure.

Röntgenotherapy is an accepted institution, an effective agent in the hands of a competent röntgenotherapeutist, and a valuable method of treatment at the disposal of the progressive physician.

Cancer of the Breast: Biological Considerations in Radiotherapy*

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Malignancy, with its concomitant fatalities, be it of the breast, uterus or elsewhere, presents today perhaps the same perplexing problem that it has for centuries past. The search for its etiological factors by the best minds, both in the laboratory and at the bedside, has availed us of only negligible and unstable data, notwithstanding the vast amount of knowledge accumulated through the tremendous laboratory and experimental efforts for a better conception of its histopathology, and its pernicious biological behavior. Though until we know something definite of the biological laws that cause or are responsible for tissue overgrowth and tumor formation, we shall be at a loss to understand the various phases of malignancy. To make it clearer let me put it in this way; in one type of carcinomata, the pathological, biological and clinical picture is quite separate and distinct from carcinomata of another group. For instance, the tumors occurring in the tongue are quite different in their malignancy from those of the face. The latter are almost benign in their clinical and biological behavior, in contrast to carcinomata occurring in tongue, breast or stomach, i.e., malignancy is made up of many variables, and it is difficult to ascribe it to one single cause. A search for one unit of causation will most likely be unfruitful, for in every case of cancer there are probably many cooperating factors, one of which predominates in one type of cancer and an entirely different one in another type.

Biological peculiarities are not dependent upon its histopathology alone, but frequently the anatomical part of the organ involved decides the degree of malignancy, dissemination, and metastasis, growth energy, and other physicochemical phenomena. This is especially striking in carcinomata involving the uterus. Here we see it very clearly—a lesion situated in the cervix is generally quite malignant, while, on the other hand, when it affects the fundus its malignancy manifests itself to a much less degree.

Similar degrees of malignancy are met with in carcinomata of the breast. Mammary tumors present themselves in one type as localized growths, remain stationary for a long time, grow rather slowly or not at all, at times without the slightest attempt to metastasize. To all appearances they behave like a benign growth, until all of a sudden they flare up to metastasize in the regional lymph nodes, and thus take on malignant characteristics.

In the second group, however, the tumor growth starts locally in the breast, it does not stay localized very long as in group one, but spreads more or less rapidly in various directions, either by lymphatics into the axillary or supraclavicular regions, or by the blood stream to parts distant from the lesion.

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*Read before the Clinical Society of the District of Columbia, at Washington, D. C., December, 1922.

There is perhaps another group, in which the malignant degeneration does not start strictly at one definite site but develops probably in more than one area in the same breast. These different foci continue to grow and coalesce to form eventually one large mass. Finally, there is a less common or extreme type where the malignancy is seen in both breasts. The interval between the appearance of a tumor in one breast and then on the opposite side may be so short that they almost appear simultaneously.

From this arbitrary classification it would appear, therefore, that the power and rapidity of metastasizing varies with different tumors in different individuals. In old people, for instance, the growth energy of a tumor is reduced to a minimum, so that the tumor may remain stationary for years. This is also true of tumors that are not very cellular but rather abundant in fibrous tissue. As a broad assumption, it may be said that fibrous tissue tumors grow rather slowly and simulate an attempt on the part of nature to retard the growth. In contrast to this is the richly vascular and cellular group, where secondary deposits are generally found in different organs. To all intents and purposes, they are clinically analagous to the pyemic manifestations of an infection. Whether these pathological phenomena can be attributed to a general lowering of the resistant mechanism of the individual, or to biological factors which render the organism powerless to stop or limit the growth energy of the malignancy, are as yet unsolved questions. Unfortunately, however, we are too often confronted with these conditions in breast tumors. Moreover, these various factors of biological and clinical peculiarities must be recognized and summed up before an attempt is made to take measures to deal with the disease. Neither surgeon nor radiotherapist should attempt to treat cancer without a thorough knowledge of the behavior of malignant tumor, or a familiarity with the anatomical spread of the disease, for any one who slurs any part of the treatment of cancer incurs an untoward responsibility.

For instance, in the therapeutic consideration of the first group in which the tumor is purely local in the breast, with no lymphatic involvement in the axilla, radical surgery will be effective. This type, especially, lends itself very favorably, both anatomically and surgically, to wide and thorough excision, not only of the localized tumor but also of the large field of threatened dissemination. Surgical technic, however, must conform to the localization of the primary growth, i.e., if the tumor is situated on the inner edge of the breast, the surgical procedure must differ from that required for one situated on the outer edge. As a general rule the attempt at surgical removal should be so directed that the tumor excised be in the centre of the field of operation.

Generally speaking, the localized breast tumor, without glandular involvement, comprises the most promising cases prognostically, and offers absolute indication for earliest surgical interference. Recoveries and cures in this class are generally of optimum proportion. Sistrunk, of the Mayo Clinic, reports sixty-four five year cures out of eighty-nine cases where there was no glandular affection. To repeat, this outlook refers only to localized tumors of the breast with no lymphatic involvement.

In the second group where there is already involvement of axillary lymph nodes, or where the lesion is no longer a localized one, in so far as it has already spread and disseminated, an entirely different side of the question presents itself. All statistics show that surgery alone in this type fails to furnish satisfactory results, no matter how radical the excision. At best the permanent five year results are less than thirty per cent., in spite of all attempts at thorough dissection. In this group preoperative radiation is especially indicated. Since, in some cases, surgery alone seems effective, and in others radiotherapy or röntgenotherapy obtains equally favorable results, it is logical to suppose that the intelligent combination of both would offer a still better outlook. This is borne out by the fact that during the past three years, the new technic of röntgenotherapy has received well deserved recognition.

The important physical and biological consideration in the treatment of carcinoma, whether superficial or deep, is to administer an efficient uniform dose of radiation to destroy or annihilate all the malignant disease throughout. How this is best accomplished depends to a great extent upon the personal equation of the radiotherapist. In the first place he should be informed of the exact depth of the lesion from the surface of the skin, and in what direction, in breast tumors, for instance, it is likely to spread or disseminate, whether by lymphatic involvement to the axillary and supraclavicular glands, or by extension, as Handley states, to the deep pectoral fascia. In addition, it is essential that the dose tolerated be carefully calculated by accurate physical measurements, in order to administer with precision an even and homogeneous radiation to the tumor itself.

The proper procedure entails many technical difficulties. In one instance it may be possible to acquire the full dose from one large field using a high focal distance; in another, it may be necessary to ray from two or three or even four areas in order to obtain a sufficient depth dose to knock out all the malignant cells within the anatomical area. This goes to prove that no one rule can be laid down to fit any two cases, the individual equation will often make what would appear at first as an unfavorable outlook into a very promising one.

To meet these conditions it is essential to improvise means to cope with the disease in a given case in the best manner. This will make plain why it is necessary to make use of paraffin blocks in one instance, and in another a rubber bag filled with water, placed over the chest in a manner to obtain an even plane. In this manner we are able to secure increased secondary scattered radiation to enhance the depth dose, and finally bring about even and uniform radiation to all parts of the tumor. To repeat what I have so often said before, all parts of e malignant tumor must receive a lethal dose roughout, otherwise it is hopeless to reckon with a mplete annihilation of the local growth.

At best, even with accurate physical dosing, we il too frequently. For one reason, the biological se for tumors is not a constant, and for another, eater and perhaps more important factors play eir part in the absorption coefficient. In spite of r best efforts in technic, to kill the tumor growth efficient radiation and in the face of possible termination of a lethal dose for cancer, only too ten are we helpless to cope with the disease. Now e question arises, how are we to reconcile these o inconsistent conditions. Our shortcomings must explained essentially on the basis that not sufficient ought has been given to this phase of the question. the first place, we are constantly speaking of a ixed or heterogeneous beam of rays as a physicoemical agent, and perhaps this would serve our rpose if the tissue or cancer cell were purely a ysicochemical reagent, on the one hand to act, and the other to react. But experimentally we know at this reaction can take place only if an interacon ensues, and in this case it means that the cell ust absorb the ray. Perhaps variations in the ility or inability to take up or absorb the ray may count for the differences in the ray absorption of e cancer cells. After all is said, it is not the nount of radiation administered that provokes the sponse, but the amount of ray absorbability of diosensitiveness of the tissue that is responsible for e reaction, and this radiosensitiveness differs in e different tissues, though every tissue reacts to diation in a varied degree, from the most radiosentive tissue to the nerve tissue, which is perhaps the ast radiosensitive. This lack of absorptive power a given carcinoma tissue may possibly explain r failure in spite of our most earnest efforts.

At this point it would be pertinent to state the pression gained from 114 cases of carcinoma of e breast treated by the new intensive radiation in e past two and a half years, some of which have en reported in previous communications. Since e biological and anatomical factors in every case cancer vary, it would necessarily follow that it nearly impossible to establish an exact carcinoma se for every localized tumor. In one instance, 0 to 120 per cent. or even less of a skin erythema se may be sufficient to arrest and destroy the mor mass, in another it may be necessary to apply ree or four times the socalled lethal cancer dose. his may entail technical difficulties in preserving rmal tissue, and in guarding against irreparable mage to the blood and hemopoietic organs. Therere I have modified the plan of procedure by adinistering a maximum radiation of 110 to 150 per nt. of a skin erythema dose to the tumor over a riod of eight to ten days, and await the repair of ood and general health to repeat the dose in four six weeks, depending upon the general condition the patient. It seems to me that there has been unintentional omission on the part of most riters to dwell with sufficient emphasis upon the cessity of maintaining the general constitutional ndition of the individual. It happens entirely too frequently that in the attempts to deal effectively with the malignant tumor, all sense of proportion is lost sight of with regard to the patient who bears the disease. After all, the individual with the lesion must be taken into consideration as to his physical state, his power to react to intensive radiation, possibly cachexia, and other constitutional disorders. Personally I have learned to pay greater attention to the postradiative treatment and also general constitutional tonicity. In this connection it would not be surprising if the good results reported in some clinics abroad were due to the special care given the general condition after the radiation, to the use of intravenous injection of iodine, arsenic, etc., in some soluble form. Since chemotherapy with radiation probably enhances biological effects, it promises greater possibilities. In combination with this the spleen, thymus, and adrenals may also be radiated to stimulate their functional activity to maintain humeral equilibrium.

From this brief and general survey on cancer of the breast, several important points come into view. In the first place, this affliction is as invulnerable and hopeless as it was before the advent of modern röntgenotherapy. A great many of these unfortunates may possibly be spared or at least sustain a symptom free prolongation of life. I hope that no one will gain the impression that radium or x ray, as we know it today, is a panacea for cancer. Far from it. It fails as often as the knife in certain types of cases, and frequently in cases in which surgery fails, it will bring about relief and even apparent arrest of symptoms.

I have taken especial pains to dwell upon our own shortcomings in technic, and also upon the lack of radiosensitiveness of certain types of malignant disease, by its inability to absorb an efficient amount of the radioactive substance. However, I wish to bring this message home to you, that radiation intelligently combined with surgery in the form of preoperative raying followed by radical surgery, and finally intensive postoperative radiation, will effect a favorable result in many socalled hopeless cases.

The real important service to be hoped for from radiation is not alone the destruction of the more or less degenerated cancer cells themselves, but the arrest of the spread of the actively growing cell, i.e., the problem is to attack the cancer cell in full vital activity, to determine how it responds to radiation, and what amount and character of radiation is necessary to destroy it. The reaction from x ray in a carcinoma may not depend only upon the intracellular change in the tumor itself but also upon the effects of the rays upon various processes in the normal tissue, though this much seems to be established, that we are not aware at present of any chemical or physical agent that can influence diseased tissue and leave the normal tissue intact. In other words, it is necessary that advances in pathological knowledge keep pace with the improvement in newer technic, and that both of them be put to a practical purpose.

The sum total of present day röntgenotherapy denotes that we are just in the developmental stage of wave therapy, the surface of which has but been scratched, and as a result we begin to see a little light, though it promises a great deal and many possibilities are in store. The future of radiation therapy of cancer would seem to depend upon a knowledge of the varied response, either direct or indirect, of the tissue to the varied amounts of radiation. This would make for an ideal biological and clinical reactivity, inasmuch as it would offer a measurement of the radiosensibility of a given carcinoma.

29 West Seventy-fourth Street.

A Comparison of the Wassermann and Kahn Tests in Three Hundred and Twenty-Nine Cases*

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At the laboratory of the New Jersey State Hospital for the Insane about twenty blood Wassermanns and about fifteen spinal fluid Wassermanns are done each week. Of these about five of the blood tests and about five of the spinal fluid tests are from syphilitics under arsphenamine treatment. The other samples are mostly from new admissions at the hospital. It is routine at the hospital to have a blood and spinal fluid Wassermann done on every new admission. The patients are mental cases.

We have had the experience of others with the difficulties of the Wassermann test. The complement may deteriorate. The amboceptor may deteriorate. The antigen may become anticomplementary or lose some of its antigenic properties. These are some of the difficulties. The technic of the test is complicated, the chances of error many. To keep the method of performing the test standard in one laboratory from week to week, being sure that the sheep cell suspension is the same and that the hemolytic system is working the same, etc., is a task; whereas, standardizing the test throughout many laboratories with their varied facilities and personalities seems almost impossible. However, the Wassermann test has been thoroughly tried and in the main has proved reliable.

It is obvious that it would be well for a procedure so important as a serological test in the diagnosis of syphilis to be at once reliable, sensitive and simple enough to be readily standardized through many laboratories. The Kahn precipitation test, as it appears in the current literature, seems to meet these requirements. We felt that we had a good opportunity at this laboratory for trying it. Consequently it was decided that Kahn precipitation tests should be run for a time at this laboratory with the Wassermann tests to see how the results compared.

We used in general the method for the precipitation tests as described by Keim and Wile (1). The antigens were prepared from dried fresh beef heart muscle finely broken up. Fifty grams of this material were placed in a five hundred cubic centimetre Erlenmeyer flask, covered with an inch of ether and placed in the icebox. After twenty-four hours' extraction the ether was yellow; it was poured off and replaced with fresh ether. This was repeated daily for three days. On the fourth day the supernatant ether was water clear. The ether was filtered off and the dried muscle spread out on paper and dried at room temperature until no odor of ether was detectable. To twenty grams of this material was added one hundred cubic centimetres of ninety-five per cent. alcohol and the whole extracted for nine days in the icebox and one day at room temperature. The alcoholic extract was then filtered off. Twenty-five cubic centimetres of this was used as a plain alcoholic antigen. To another twenty-five cubic centimetres of it were added one hundred milligrams of cholesterin.

In the work here reported readings of the Kahn test will be readings of the cholesterinized antigen. A discussion of results with the plain antigen as compared with results with the cholesterinized antigen will also be given.

The cholesterinized antigen was used in a dilution of one part antigen to three parts physiological sodium chloride solution. The plain alcoholic antigen was used in a dilution of one part antigen to two parts of physiological sodium chloride solution. The mixtures were clear and opalescent. They were always used within an hour after dilution. The dilutions were made by rapidly adding the saline to the measured quantity of antigen. It seems important that the antigen be diluted in just this manner. After running for several weeks with good agreement between the Wassermann and Kahn tests, one week we were surprised to find very little agreement between the tests. We were testing nine known syphilitics at the time and whereas we got strongly positive Wassermann tests with their sera, the Kahn tests were mostly negative. On closely questioning the technician who had mixed the antigen it was found that she had made a mistake on that day and had slowly measured the antigen into the required amount of saline and great care was taken thereafter always to mix the antigen in the same way by rapidly adding the saline to the measured quantity of antigen. When this was done there was never a marked disagreement in the results of the two tests. The serum was always inactivated for twenty minutes on the day the tests were performed. The setup of the tests was as follows:

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Three tenths cubic centimetre of serum was measured into each of three tubes about seven centimetres high, one centimetre diameter. To the first tube was added .05 c. c. of saline. This was the serum control. To the second tube was added .05 c. c. of the plain antigen dilution, and to the third tube was added .05 c. c. of the cholesterinized antigen dilution. The racks of tubes were vigorously shaken for three minutes and then placed in the incubator at 37.5° C. The following morning the tests were read, and, in order to eliminate personal bias, by someone who had not seen the results of the corresponding Wassermann tests. The results were recorded as follows:

—negative precipitation
++++a precipitate of one or more large clumps floating in the serum
+++one large clump or two rather large ones.
++moderate size flocculi
+small flocculi
±fine flocculi (this is a doubtful reaction)

The precipitate is definite so that the results are not at all obscure. The clumps would break up into fine flocculi or granules when shaken. Sometimes in the tests there would be a white suspension near the top of the fluid which differed from the clumps and flocculi in that it disappeared on shaking. There was no mistaking it for a positive precipitation. Hemolysis in a serum did not seem to interfere with the test. If a serum was very cloudy it could not be read, but if only slightly cloudy it could be. Spontaneous (immediate) positive precipitation tests were occasionally noticed but were not recorded.

The Kahn tests and the Wassermann tests were done on the same day. A cholesterinized human heart antigen was used in the Wassermann tests; they were fixed in a water bath at 37.5° C. for one hour; they were read after an overnight period in the icebox.

Of the three hundred and twenty-nine sera tested with both the Wassermann test and the Kahn test, there was agreement between the two tests in 92.4 per cent. One hundred and twenty-two of the three hundred and twenty-nine sera showed some degree of positive reaction in one test or both. Of these, there was agreement between the two tests in 79.5 per cent. Ninety-one of the three hundred and twenty-nine sera were from syphilitics under arsphenamine treatment. Of these ninety-one, there was agreement in the results of the two tests in 80.2 per cent. Eighty-seven of the ninety-one sera from syphilitics under arsphenamine treatment showed some degree of positive reaction in one test or both. Of these eighty-seven, there was agreement in the results of the two tests in 78.1 per cent. Two hundred and thirty-eight of the three hundred and twenty-nine sera were from new admissions at the hospital. Of these there was agreement between the results of the two tests in ninety-seven per cent. Thirty-five of the two hundred and thirty-eight sera from new admissions at the hospital showed some degree of positive reaction in one test or both. Of these thirty-five there was agreement in the results of the two tests in eighty per cent. Tables I and II give detailed results. Table I gives the results with the sera of the ninety-one syphilitics under arsphenamine treatment. Table II gives the results with the two hundred and thirty-eight sera from new admissions at the hospital.

TABLE I

Sera of Ninety-one Syphilitics under Arsphenamine Treatment

	Kahn test	*Wassermann test*
40 sera	++++	++++
15 sera	+++	++++
6 sera	++++	+++
2 sera	+++	+++
1 serum	±	neg.
1 serum	+++	++
3 sera	+	++
2 sera	+	neg.
1 serum	neg.	±
4 sera	neg.	neg.
(the above was termed agreement)		
2 sera	++	neg.
2 sera	++++	+
1 serum	+++	+
1 serum	+++	±
5 sera	++	++++
1 serum	++++	++
1 serum	++++	neg.
1 serum	±	++++
2 sera	neg.	++++
1 serum	±	+++
(This was termed disagreement)		

The sera from the syphilitics was always one day older when tested than that from the new admissions. Whether the age of the serum makes the Kahn test weaker we do not know. We had two sera from cases not under arsphenamine treatment which when fresh and first tested gave both ++++ Kahn and Wassermann tests. When these two samples were about a week old they gave weakly positive Kahn tests but still the ++++ Wassermanns. A serum from a third case gave ++++ Wassermann and Kahn tests when tested on two successive weeks. Then for two successive weeks later this same sample gave a ++++ Wassermann and negative Kahn test. When the fourth test was being made on this sample, a fresh sample from the same man, who had been started on arsphenamine treatment, was tested. The Wassermann with this fresh serum was ++, the Kahn test +.

TABLE II

Two Hundred and Thirty-eight Sera from New Admissions

	Kahn test	*Wassermann test*
14 sera	++++	++++
3 sera	++++	+++
1 serum	+++	++++
3 sera	+++	+++
6 sera	±	neg.
1 serum	neg.	+
203 sera	neg.	neg.
(the above was termed agreement)		
1 serum	+++	neg.
2 sera	++	neg.
1 serum	++	++++
1 serum	++++	++
1 serum	neg.	++++
	(test repeated with same result)	
1 serum	±	+++
(this was termed disagreement)		

One of the two sera in Table II in which the Kahn test was ++ and the Wassermann test was negative was from a man seventy-four years old. The diagnosis of his case was senile dementia. The serum in Table II showing a ± Kahn test and +++ Wassermann was from a case diagnosed dementia precox, catatonic type. The spinal fluid from this case gave a negative Wassermann. In the other cases of disagreement in Table II, the spinal fluids from the cases gave ++++ Wassermann tests and the diagnoses of the cases were all general paralysis or paresis.

Although we had some positive Kahn test reactions with the plain alcoholic antigen, they were not many and were weaker than the reactions with the cholesterinized antigen. The results with these are shown in Table III.

TABLE III

Kahn Test Results with Plain Alcoholic and Cholesterinized Antigens

	Plain Antigen	*Cholesterinized Antigen*
46 sera	neg.	++++
18 sera	neg.	+++
9 sera	neg.	++
4 sera	neg.	+
8 sera	neg.	±
1 serum	++++	++++
4 sera	+++	++++
12 sera	++	++++
6 sera	+	++++
1 serum	±	++++
3 sera	+	+++
1 serum	+	++
2 sera	±	±

Kahn tests were performed parallel with the Wassermann on 177 spinal fluids. The tests were performed in the same way as the serum tests except that .6 c. c. of spinal fluid was used. These also were from syphilitics and from new admissions at the hospital—in fact from some of the same people from whom the sera came. There was agreement between the results of the tests in 68.3 per cent. only. In the disagreements it was the Kahn test that was weaker or negative. We feel that a larger amount of spinal fluid should have been used in the tests. But we were limited in the amount of spinal fluid that we had and only rarely had enough to use larger amounts.

This work has convinced us that the Kahn test has great possibilities of being a simpler, more direct, more readily standardized method than the Wassermann test for serological diagnosis of syphilis. But we would want to see it more thoroughly worked out and tried, before we used it to replace a test as reliable as the Wassermann.

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Urography*

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Perhaps no field of röntgenology is receiving more attention at the present time than that of urography, and we believe justly so, for a great deal of information of a definite nature and of diagnostic importance may be obtained in this manner. Therefore a modern equipment for this work should be a part of the armamentarium of every well appointed röntgen laboratory.

The injection of the opaque solution bears the same relation to the study of the genitourinary tract that the opaque meal does to the study of the gastrointestinal tract, and we should, therefore, equip our x ray laboratories as thoroughly for this type of work as for gastrointestinal work. The difficulty of the technic of genitourinary investigation, however, is very great and requires the cooperation of a trained urologist. Fortunately, at the present time, there are many urologists who have had good training in the technic of diagnosis of the diseases of the genitourinary tract, and these men are almost invariably glad to cooperate with competent radiologists, either in the hospital or office laboratory. In a short time there will be on the market cystoscopic tables equipped with Bucky diaphragms and with all the x ray attachments essential for the making of urographs with a minimum of discomfort to the patient and a minimum consumption of time.

With the establishment of such a cooperation, it is evident that in most cases it will become the duty of the radiologist to determine what cases should be submitted to this type of examination, and what should be the definite procedure in each case. This brings us to the realization that the röntgenologist is not a technician, but a consultant in the broadest sense of the term and that, therefore, he should understand the terminology of lesions of the urinary tract and be thoroughly informed regarding the significance of the history, laboratory findings, and clinical picture of every case brought to him for examination.

The majority of cases with symptoms referable to the urinary tract are sent to the röntgenologist for an examination to determine the presence or absence of stones. But the referring doctor will be just as appreciative of a correct interpretation of whatever pathological condition in the genitourinary tract that may account for the patient's symptoms in a case in which no calculi are present as in a case in which stones are present. That is, a request for an x ray examination of this tract should be met exactly as a request for an examination of the gastrointestinal tract is met, i. e., by an exhaustive study to determine any pathological condition that may be present which is demonstrable by the x rays. The röntgenologist would hardly feel that he had rendered his best services to a patient with gastrointestinal symptoms, if he simply made x ray plates of the gallbladder and reported that no stones were seen in the gallbladder area but made no further investigation.

It is not, however, to be inferred from this that all genitourinary examinations should include the study of the tract by the injection of an opaque solution. For example, in considering cases which show suspicious shadows, the following must be ruled out as possible causes:—1, warts, scars, etc., on the surface of the body over the kidney area; 2, gallstones; 3, calcified glands; 4, calcified costal cartilage; 5, previous injection of opaque substance, as of bismuth, silver salts, or other solutions; 6, phleboliths;

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*Read before the American Röntgen Ray Society, Louisville, Ky., February 24, 1923.

7, foreign bodies in the intestinal tract, compound cathartic pills, enteroliths, or retained barium, particularly in diverticuli; 8, inspissated pus in tubes.

These may seem to be outside the subject under discussion but is it not all important to determine exactly the cause of a suspicious shadow and its location? Certainly it is not desirable to submit a patient to a urographical examination when a suspicious shadow is seen on a röntgenogram if it can be determined that this shadow is due to a wart on the patient's body or possibly due to bismuth which the patient has been taking medicinally. In other words, a careful study of the case must be made by the easier methods in order to rule out all such possibilities as those listed above. Moreover, it is important to make at least two plates of the same area, thus ruling out artefacts in the plate itself.

Recently we had sent to us from New York for operation a patient who had with her x ray plates of the genitouninary tract which showed a suspicious shadow in the ureteral area. This case had been seen by two able men in New York, one a röntgenologist and the other a urologist, and both agreed that the shadow was that of a stone in the ureter. Only one plate of the ureter had been made, however. We reexamined the case and found nothing. By careful examination in the oblique position of the plates brought by the patient, we found that a small drop of solution had fallen on the plate just over the ureter and caused the mistaken diagnosis; this could not have occurred if two plates had been taken of the same area as in our routine procedure.

The röntgenologist should not be in a hurry to give an opinion. It should be borne in mind that the report from the röntgenologist as to the pathological findings will usually determine whether or not a surgical operation is necessary and that such an operation is usually a major one and of grave significance to the patient. The decision may well be delayed, therefore, for a reexamination of the patient at a later date may show that enteroliths or foreign bodies have changed their position thereby establishing their identity.

For differentiation between a gallstone and a kidney stone, stereoscopic plates should be made, and also a lateral plate, which will help to determine whether the shadow is posterior in the kidney area or anterior in the gallbladder area. We have recently been studying the stereoscopic plates with a localizing stereoscope which is of considerable aid. By this method in a case of a gallstone a plate in the gallbladder position should show the stone smaller, more distinct and close to the spine while a plate in the kidney position should show a shadow of larger size and of lesser density, and forced up under the ribs by the compression.

When all the simple procedures have been exhausted in an effort to determine the nature of a suspicious shadow, but without success, more elaborate methods must be used. In many cases of stone in the ureter, the opaque catheter will determine its location. However, this cannot be relied upon in every case and particularly in those cases in which the catheter does not come in contact with the shadow an ureterogram will have to be made.

A large, dilated ureter may have within it a stone which lies some distance from the catheter, or a tortuous ureter into which a catheter cannot be passed for its entire length may hold a calculus in one of its loops. In either of these cases the position of the stone can be determined only by a ureterogram.

By means of a pyelogram determining the location of the kidney pelvis, a suspicious shadow in the kidney area may be found to be a stone in the pelvis of the kidney or in the cortex, or the shadow may be found to lie outside the kidney. So also a cystogram will determine the presence of a calculus in the bladder or in a diverticulum, or localize the suspicious shadow outside the bladder area.

Thus far we have been discussing only those cases in which a suspicious shadow is found in the genitourinary area. These present comparatively simple problems.

The problems presented by another group of cases, those in which no suspicious shadows are seen, are not so simple and it is in this group that urography becomes the most valuable method of diagnosis. In these cases, the history, all the physical findings, the symptoms and both the chemical and the microscopical urinalysis must be carefully considered in determining what urographical procedure should be undertaken. As it would be impossible for me in the limited space at my disposal to describe all the methods which may be used in these cases we shall consider only a few of the most important, and in particular the indications for and the technic of making cystograms, ureterograms or pyelograms.

Every röntgenologist should be able to make a urinary cystograph, which can be done without the aid of an urologist. The technic is simple. First, with a sterile catheter, the bladder should be washed out with a sterile solution and then filled with a solution of sodium iodide, films being then made in the anterior posterior and in the lateral position. This should be done in cases in which the symptoms are those of a persistent cystitis with infection, in which no calculus can be found in the bladder. These cases give a history of long continued symptoms with little relief after medical treatment or irrigations. Many of them show a single diverticulum or multiple lesions of the bladder in which urine may be retained for long periods with resulting infection and diverticulitis.

Posterior diverticuli are sometimes seen only by a lateral exposure which should, therefore, always be made. The technic is not difficult and cases of this type should not be overlooked, as in many of them surgical treatment gives prompt and permanent relief from all symptoms.

As for the indication for making a ureterogram or a pyelogram, this may be determined by the history of the case. In cases with intermittent attacks of pain in the kidney and ureteral areas, with no evidence of calculus and in which gastric and duodenal ulcer and gallbladder disease have been ruled out, a careful study of the ureter and kidney pelvis on the affected side should be made to determine the presence of a possible intermittent hydronephrosis. We see many of these patients who have undergone operations on the gallbladder and appendix without relief. Intermittent hydronephrosis is quite frequently found and should be considered as a possibility, particularly when the symptoms indicate a pathological condition in the upper right quadrant.

Cases with persistent hematuria, in which no causative factor can be found in the bladder, often require consideration. The side to be examined or injected may be determined only after the insertion of the catheters in the ureters makes it possible for the separate specimens to show from which kidney the hemorrhage is coming. If, after the catheters have been introduced, one side drains with a constant flow unlike the interrupted flow of the urine from a normal kidney, a possible hydronephrosis is suggested and a urographical examination is indicated.

If the discharge of large quantities of pus from a ureter indicates a pyonephrosis, the diagnosis may often be confirmed by a pyelogram. By means of a pyelogram a tumor mass in either side may either be definitely diagnosed as a kidney lesion or be shown to bear no relation to the kidney. The displacement of a kidney may be definitely determined by a pyelogram of its pelvis. If a case with hematuria shows deformity of the kidney pelvis, the patient should always be questioned regarding the occurrence of trauma, as a blood clot in the kidney pelvis may give a shadow simulating a tumor of the kidney. In cases which show a large dilated kidney pelvis, after the catheter has been withdrawn, plates should be made with the patient in the upright position and without compression. These will often reveal that the obstruction is due to kinks in the ureter, whereas if the plates are taken with the catheter in place, the kinks may be straightened out and the cause of the obstruction will not be found.

The röntgenologist should become familiar with every phase of this work in order to render the best service to the referring physician and to his patient. In our laboratory the patient is examined in the urological section on a cystoscopic table into which a Potter-Bucky diaphragm has been incorporated. Films are first made with catheters in both ureters. Then the side we wish to examine is injected by the syringe method with a solution of sodium iodide until the patient feels a twinge of pain in the kidney region and films are made in the anterior posterior position with a soft rubber bag compression. The patient is then placed in the sitting posture and the catheter withdrawn to the lower end of the ureter. If necessary a small amount of the sodium iodide solution is then injected into the ureter; this is rarely required, however, as the ureter will be filled by the return of the solution from the kidney. In this latter position no compression is used and kinks of the ureter, as well as displacement by ptosis, may easily be shown.

The injection of an opaque solution into the genitourinary tract must be done only by one who is thoroughly familiar with the technic and aware of all the dangers with which it may be fraught. Catheters have been known to be inserted too far into the kidney pelvis, causing a loop with a knot in the end which required an operation for its removal. Danger of overdistention of the kidney pelvis and of the rapid absorption from the kidney pelvis as shown by a phenolsulphonephthalein injection into one pelvis and its recovery in a few minutes from the other kidney is to be borne in mind in urological examinations. Dr. Lower, who is the head of our section in urology, makes it a rule from which we seldom deviate, that only one side may be injected at a single examination. It is evident, as I have already stated, that the cooperation of a competent urologist is essential in this work.

I realize that I have touched upon only a few points in the application of urography to the diagnosis of lesions of the genitourinary tract; but, if we succeed in stimulating the study of this subject and the broader application of its principles, we shall feel amply repaid for our efforts.

Oral Infection in Relation to Health*

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According to reliable vital statistics the average span of life in this country has been rising gradually since 1906. This gratifying state of affairs is due to many factors, among which may be mentioned improved economic and living conditions, a better knowledge of the principles underlying the conservation of child life, public health measures preventing and controlling epidemics, the more general understanding of the causes, prevention and treatment of metabolic disturbances, and finally the unqualified recognition by the medical profession of the importance of the focal infection theory.

It is with the last factor—focal infection—that we are concerned in this paper. If tumors, tuberculosis, traumatic injuries, glandular dystrophies, such as cretinism and acromegaly, syphilis, and the acute exanthemata are eliminated from consideration, we are at once impressed with the fact that almost all the conditions physicians are called upon to treat are the direct or indirect result of focal infection. Thus, heart disease, disturbances of the endocrine system, polyglandular insufficiency, diabetes, nephritis, various forms of mental deterioration, functional nervous disturbances, arthritis, secondary anemia, are almost always the end results of preexisting infections. If the infectious foci can be detected in time, before permanent damage has been done, as a result of the distribution through the body by way of the lymph and blood channels or by direct swallowing of bacteria and toxins, countless millions of people may be saved much suffering and the working power, efficiency and happiness of the race greatly increased.

The usual sequence of a chronic toxemia is as follows: a bacterial infection starting in teeth, gums, tonsils, or accessory sinuses; secondary foci in stom-

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*Read at a meeting of the Orange Mountain Medical Society, Orange, New Jersey, June 15, 1923.

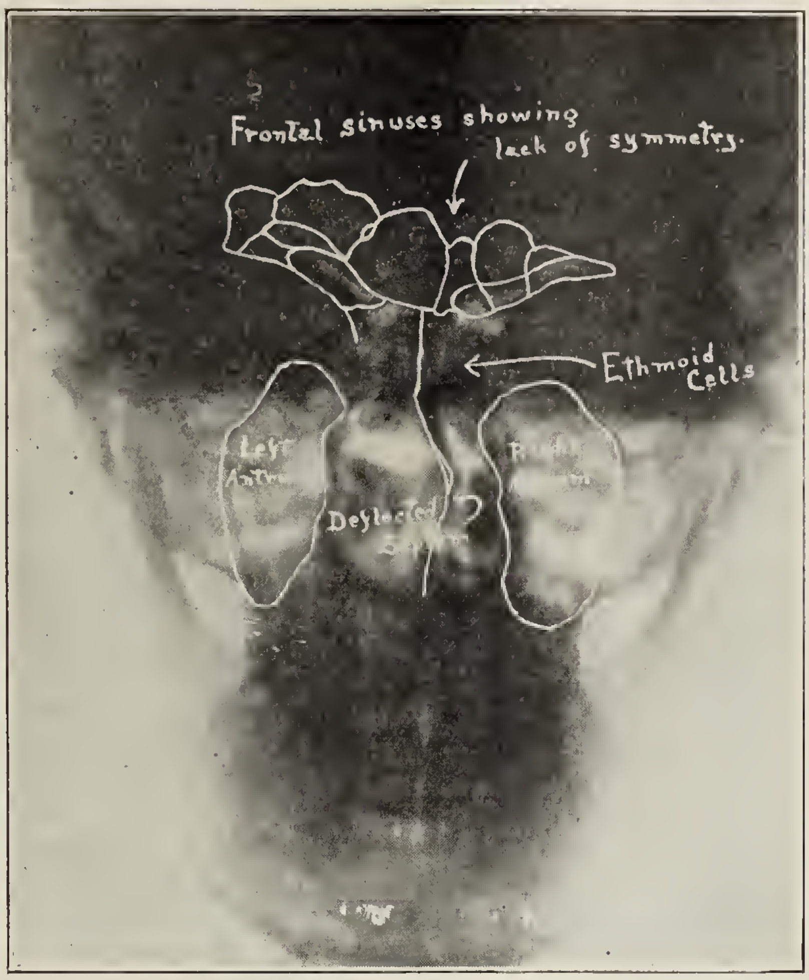


FIG. 1.—Rœntgenograph of head, showing lack of symmetry in frontal sinuses—a condition frequently met with—which demonstrates the unreliability of transillumination in diagnosing frontal sinus disease.

:h, duodenum, gallbladder, pancreas, or appen- x; following which we hd often a chronic mu- ous colitis, enlarged ediastinal glands, spas- : constipation, intesti- l stasis, chronic nephri- s, endocarditis, myo- rditis, nephritis, arthri- s, various psychoneu- ses, etc.

With a knowledge of is fact in mind, it is ap- rent at once that every tient who comes to us r advice about a ronic ailment is entitled at least one complete nd thorough physical rvey. The gastroin- stinal specialist who ndertakes to treat an fectious achylia gas- ica without examining e oral cavity for dis- sed teeth or tonsils, or e surgeon who operates r hemorrhoids without amining the patient for llbladder disease, or her trouble higher up in the alimentary canal, are the class with the internist who prescribes for a yocarditis or a nephritis without attempting to cate and eradicate the source of the toxin which s caused the heart or kidney disease.

It may be worth while mentioning at this point that ery patient should have a Wassermann blood test ne. It takes only a minute to obtain the speci- en, and a single positive case picked up in this ay, out of fifty or a hundred, will well repay e for the trouble and save unpleasant em- rrassment and discomfiture later on. Where philis is strongly suspected, a negative Was- rmann in the blood must not be taken as final. provocative salvarsan injection should be given d a series of blood Wassermann tests done every y or every second or third day for ten days there- ter. Many patients will require a spinal puncture, d a spinal fluid Wassermann, before syphilitic in- ction can be definitely ruled out.

After the survey, which should always include a mplete urine analysis, supplemented in certain ses by a blood count and blood chemistry, by an x y examination, by gastric analysis, by duodeno- liary drainage, by rectal or vaginal examination and stoscopy, the findings may be correlated and the ajor and minor foci of infection carefully noted fore deciding on a rational plan of treatment.

Much of the ridicule to which we medical men are bjected by the laity and the humorous writers in e press is due to our own hurried and superficial ethods of examining patients. Thus the physician ho when consulted by a sufferer from, let us say, iatica, looks into the mouth, and says without fur- er investigation, "Ah! here is your trouble! Have ose two goldcrowned roots removed and you will get well," may strike it happily in an occasional case, but there will be many instances where such extraction will accomplish no good, and he will be confronted by a disgruntled patient who will perhaps subsequently dissuade some friend or relative from having an oral infection treated where it is unquestionably indicated.

In studying our chronic cases we are often impressed with the fact that the primary focus is not always the major focus. Thus a careful study may reveal a chronic cholecystitis of low grade infective virulence, with perhaps in addition a chronic mucous colitis or spastic constipation as the major focus, although this condition has resulted from a bacterial infection starting in the teeth or tonsils. It will readily be seen that advising such an individual to have infected teeth or tonsils removed without attempting to treat the gallbladder or colon condition is very apt to lead to therapeutic disaster or disappointment. Likewise, it is well to bear in mind that headaches may be due to a nephritis, intestinal toxemia or arteriosclerosis, as well as to infected antra and frontal sinuses; joint involvements may be due to a gouty diathesis, syphilis, gonorrhea or tuberculosis; a neuritis in the obese individual with low blood pressure, to potential diabetes (Allen), detected only by a blood sugar determination; the pains in the shoulders and arms to degenerative changes in the aortic arch; or the clinical symptoms may come from an infected cervix, prostate, seminal vesicles, or tubal disease.

With this knowledge constantly in mind we will not be led into the all too common error of urging the reckless extraction of teeth first and then, if the patient fails to improve, studying him further to find out what really ails him.

We must not be misunderstood as opposed to the removal of diseased teeth or tonsils. On the contrary, we believe in the most radical efforts at removal of all oral infection. But we wish to emphasize the importance of thoroughness in the examination of our patients and candidness with them, otherwise we shall surely bring our art into disrepute. The patient who comes to us for help, and is found to be a victim of multiple infectious foci—teeth, tonsils, achylia gastrica, duodenitis, biliary stasis, a nonfunctioning colon, chronic nephritis and myocarditis—should not be promised a cure after the removal of a few teeth. Such a patient should be allowed to see the cards face up on the table, and made to understand that the elimination of the oral infection is only one step in a general systemic cleaning up process. He or she should be made to understand that the diseased teeth constitute only one section—perhaps the least important—of the vicious circle. In other words, if the doctor does not promise too much, the patient will not expect too much, and will not be disappointed if no immediate improvement is noted. On the contrary the properly prepared patient gives us willing coöperation and follows our guidance cheerfully, instead of becoming a recruit in the ever increasing army of skeptics, therapeutic misanthropes, and discontents, who go from bad to worse and finally land in the hands of the "cultist" or "curist."

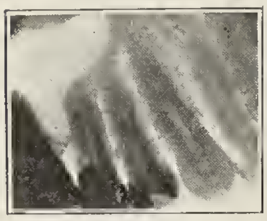
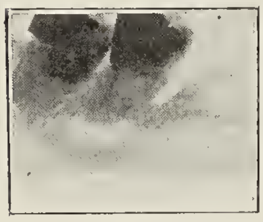


FIG. 2.—Upper jaw. Showing downward projection of antrum, a condition sometimes mistaken for alveolar abscess by inexperienced Roentgenologists.

The physical survey should begin with a careful inspection of the oral cavity and accessory sinuses. The tonsils are first examined, and brought into view. The Hurd separator is a useful instrument for this purpose. By it the anterior pillar is hooked back, and the tonsil squeezed forward, when the crypts, if there are any, may be emptied of pus or serum, and cultures taken. Many tonsils, which appear quite normal on casual inspection, will show definite infection when examined in this manner.



Two methods of diagnosing sinus trouble are open to us—transillumination and the x ray. The former is valuable in examining the antra, but of doubtful use in examining the frontal sinuses, for the reason that these sinuses are rarely symmetrical, as the x ray films easily demonstrate (Fig. 1). The x ray is a sure, unfailing diagnostic aid in the examination of teeth and sinuses. The teeth should always be carefully inspected and if there are large fillings, discolorations, gold crowns, permanent bridge work or pyorrhea, a complete x ray examination is absolutely essential. We do this work ourselves, in our own x ray laboratory—for several reasons: it saves time for all concerned, and we believe the work can be done more satisfactorily in a general laboratory than in the specialized dental laboratory of the average oral surgeon. Furthermore, we now always include stereograms of the facial sinuses in all röntgen dental examinations, and the average dentist is lacking in the knowledge or equipment to do this work properly.

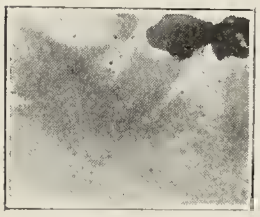


FIG. 3.—Lower jaw. Apical abscess extending into inferior dental canal.

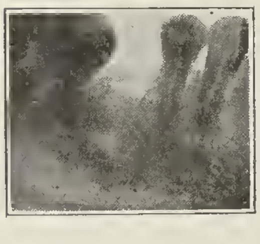


FIG. 4.—Lower jaw. Area of residual infection; osteomyelitis extending into inferior dental canal.

Every physician doing general diagnostic work must himself understand how to recognize x ray pathology in teeth or sinuses, and to interpret the significance of the röntgen findings, and thus avoid diagnostic errors. It has happened that downward projections of the antrum (Fig. 2) have been mistaken for abscesses and other equally serious errors have been made by men whose lack of experience in interpreting dental x ray films has led astray.

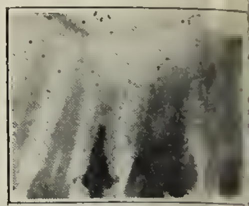


FIG. 5.—Upper jaw. Peridental membrane destroyed; infection extending through floor of antrum.

Impacted and unerupted wisdom teeth are a frequent cause of trouble, such teeth often showing coronal abscesses or other evidence of infection. The apical abscesses and granulomata, pyorrhea, sclerotic bone, osteoclasia, cysts caries, areas of residual infection, etc., are a few of the conditions most frequently met with and easy of recognition by the practised eye.

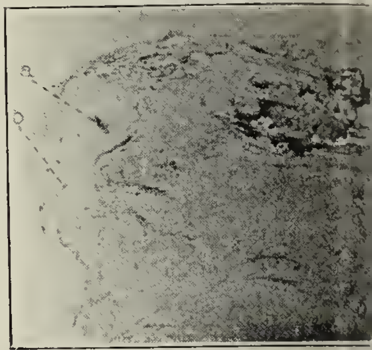


FIG. 6.—Section of granulom from apex of tooth. Low power. Note dark area "a" in center o blood vessel and lymph tract "b.

When we reflect on the bony anatomy of the mouth, it is easy to understand why diseased teeth so readily lead to systemic infection. On the lower jaw we have the inferior dental canal with its artery, vein, lymph channel and nerve. The apices of the teeth on the inferior maxilla are separated normally from this canal by only a thin partition of bone. When the lower teeth become diseased, and there is bone destruction from osteomyelitis and alveolar abscess (Figs. 3 and 4), the blood, lymph vessels, and nerve in the inferior dental canal are literally bathed in pus, with the result that microorganisms and bacterial poisons find an entry into the circulation and are carried to distant parts of the anatomy. Thus Rosenow has demonstrated that pyelitis and cystitis are often hematogenous infections from the teeth and that the end results of these diseases are frequently renal calculus and stone in the bladder.

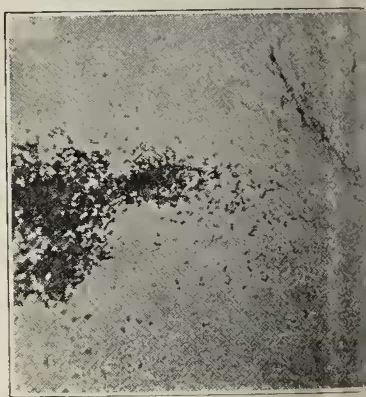


FIG. 7.—Cross section of da area "a" in previous Fig. 6. High power. Showing clump streptococci with microorganism invading adjacent tissue.

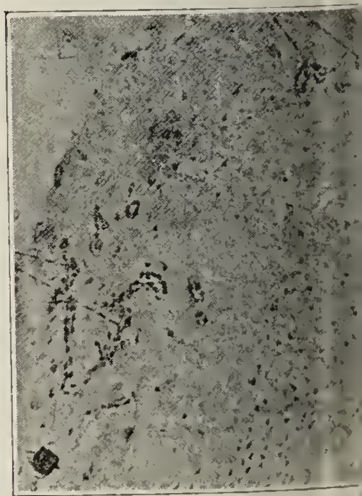


FIG. 8.—Section of granulom at apex of infected tooth, showi cross section of capillary e tirely occluded with streptococ and cross sections of capillar showing single layer of endothel cells.

On the upper jaw likewise, the lateral incisor, the cuspid, bicuspid, and first molar, are in close contact with the floor of the antrum. Infection at the apices of these teeth may and undoubtedly often does extend directly into the antrum (Fig. 5). It must be remembered that every time the jaws are rought together in mastication a pressure of from orty to sixty pounds is exerted. Pus pockets or ranulomata in the alveolar sockets of either upper r lower jaws, when subjected to such pressure, may asily exude toxins and even live bacteria into the djacent tissues, blood and lymph vessels (Figs. 6, 7, and 8).

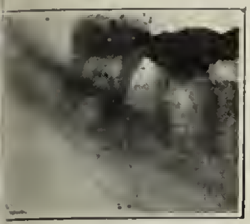
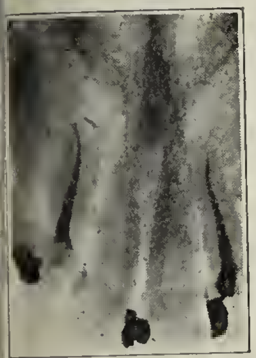


Fig. 9.—Lower jaw. 'artially filled root anals; devitalized ooth without definite oentgen pathology.

Antrum infections are often overlooked, as they rarely give local symptoms of pain or tenderness. There may be a chronic rhinitis, enlarged middle turbinate or mucopurulent discharge into the nasopharynx. The symptoms are more often those of a chronic toxemia. Functional psychic phenomena are common. I recall the case of a recent patient, a lady of forty-five, who had a delusion of ersecution by the Ku Klux Klan. We made a öntgen diagnosis of a right antrum infection, and operated, although no symptoms directly referable to the antrum were observed. When it was opened the cavity was found to be filled with necrotic tissue, polyps, and bone caries, the curettings being so malodorous that the windows of the operating room had to be opened.



Edema of the lower eyelids—which we were taught as medical students to regard as a symptom of Bright's disease—is in my opinion frequently an indication of chronic antrum or ethmoid infection.

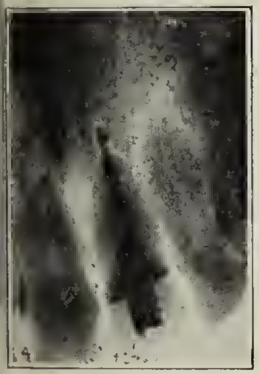


Fig. 10.—Upper jaw. Completely filled root canals; no definite röntgen evidence of infection.

The most brilliant results in the annals of medicine and surgery have followed the removal of infected teeth, tonsils and the opening, curettage and drainage of diseased sinuses. Obstinate facial neuralgia, various forms of neuritis, tinnitus aurium, chronic suppurative otitis media, iritis, recurring furunculosis, malignant endocarditis, digestive disturbances, particularly infectious achylia gastrica, chronic pyelitis, rheumatic fever, arthritis and a long list of other ailments have over and over again been cured by oral surgery. Enlarged cervical glands, all varieties of headache, chronic endocarditis, symptoms of nephritis and myocarditis, metabolic disturbances, among which we desire to mention prominently hyperthyroidism, have been known to disappear or have been greatly relieved by the removal of infected tonsils or teeth.

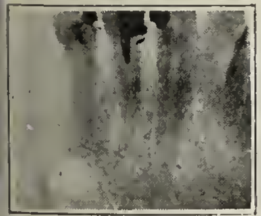


Fig. 11.—Lower jaw. Cyst formation resulting from residual infection.

While it is unquestionably wrong to advise patients suffering from chronic ailments to have all their teeth removed without even a röntgen diagnosis, as is frequently done by certain overzealous physicians nowadays, the writer is firmly of the opinion that all teeth showing gross apical pathology and plainly evident alveolar infection or general pyorrhea should be removed. But teeth which are vital and useful for reconstruction purposes should never be needlessly sacrificed.

The x ray frequently shows pulpless teeth with partially or completely filled root canals but without definite röntgen evidence of apical infection (Figs. 9 and 10). Should such teeth be extracted? This is a mooted question. There are the radical physicians and dentists who maintain that all pulpless teeth are infected and should therefore be removed. There are others who assert that not all pulpless or devitalized teeth are dead, and these men advise leaving such teeth alone, particularly if the röntgen film shows the presence of an intact peridental membrane. Still others—the ultraconservatives—believe that a tooth should be saved at any risk. What is the correct solution? Unfortunately, there are no hard and fast rules to guide us. In deciding whether or not devitalized or pulpless teeth, which show no visible röntgen apical infection, are to be removed, I believe we should be conservative at least in selected cases, until it can be proved definitely that all such teeth are infected. This opinion might of course be modified in the case of a sufferer from a chronic progressive ailment like arthritis, if a most exhaustive search failed to find any other possible focus. In such a case both physician and patient would, it seems to me, be justified in taking a gambler's chance and sacrificing one or more dead teeth even though the röntgen films showed nothing more serious than absence of vitality. The patient should, however, be told frankly that the extraction is largely experimental, but justified by the seriousness of the outlook. Occasionally a long shot of this kind hits the bull's eye.

All dental extracting should be done by a skillful oral surgeon who operates in the modern way, with the minimum of trauma. The alveolar cavity must be cleaned out and all necrotic tissue removed by careful curettage, as otherwise an infected process may be left behind to give trouble in the future. It is not an uncommon experience to meet cases where the gum has healed over after extraction and looks quite normal, but the röntgen film reveals distinct areas of residual infection (Fig. 4), or of cystic degeneration (Fig. 11). This is often seen in many edentulous jaws. After extracting teeth, the importance of early restoration of the patient's masticating efficiency should be borne in mind.

Since it is conceded that oral infection, particularly dental pathology, is such a prolific source of disease and suffering, the importance of proper prophylactic care of the teeth and mouth cannot be overestimated. This must begin in infancy with proper feeding, because it is a well known fact that malnutrition and varying degrees of rickets and scurvy cause faulty development of the jaws and the bones of the face, with resultant irregular teeth and poor occlusion.

The first or temporary teeth require just as much care as the permanent ones. Formerly, mothers were told by their dentists and physicians to pay no attention to decay in the temporary teeth. It was said that these first teeth must be retained at all hazards, as their removal would affect the growth of the jaws, the permanent teeth would be crowded and overlap, faulty occlusion would result and the child's beauty be permanently marred. This advice was bad. Decay in the temporary teeth should be prevented by proper feeding and proper cleansing and if found to exist treated just as thoroughly and radically in a child as in an adult. Regular dental inspections of a child's mouth are of utmost importance.

Acids forming in the mouth from decomposing food cause decalcification of the teeth, caries and cavity formation. If the caries extend into the pulp of the tooth it means toothache, infection of the nerve and death of the tooth. Such acid formation—usually lactic acid—results from carbohydrate food fermentation. The germs always present in the mouth act on the carbohydrate food, i. e., sweets, candies, jams, jellies, sugars and starches, if it is allowed to remain on or between or about the teeth and cause the formation of the corrosive lactic acid. Soft, sticky, carbohydrate foods, such as candy and sweets, should therefore be eliminated as much as possible from the child's diet.

Nature's method of preventing caries lies in the saliva, whose ferment, ptyalin, has the property of digesting and dissolving carbohydrates, and whose alkalinity neutralizes harmful acids. Saliva is therefore the best mouth wash, and its free flow should be stimulated by giving food which requires thorough chewing, and acid fruits such as oranges and apples. I believe that the ptyalin of the saliva is not there to aid gastric digestion but to protect the teeth.

In cleansing the teeth, ordinary brushing is not enough. Dental floss must be used to remove particles from between the teeth and the tooth brush must be made to move up and down as well as across the teeth. Care must be observed not to treat the mouth roughly, or to bruise or traumatize the gums in cleansing the teeth with too stiff a brush. Too vigorous brushing may cause the gums to recede from the teeth and thus cause pyorrhea, with pus pocket formations, later in life.

Prompt dental intervention should be advised whenever decay is detected in a child's teeth, because infected material from the oral cavity, as previously pointed out, may be swallowed with the food or saliva, or the bacteria and their toxic products may enter the blood or lymph streams and be carried throughout the body, thus laying the foundation for much subsequent ill health. Vital teeth should be carefully filled but one should not hesitate to advise the extraction of a dead tooth even in a very young child.

Irregular teeth are more likely to collect food and are therefore more prone to decay. Faulty occlusion causes undue trauma on certain teeth, which predisposes to infection and makes proper mastication difficult. Where such irregularity of teeth and faulty occlusion are observed, proper correction by a good orthodontal surgeon should be sought. Modern dentistry works miracles in the alleviation of such conditions.

The wise doctors and the wise oral surgeons of the future will be the ones who endeavor by advice and counsel to prevent pathological lesions. To do this they must have minds ready and willing to grasp promptly the accepted facts of experimental physiology, and to educate the public to recognize the practical application of proved physiological principles. The best means of conserving health is by assisting nature to help herself.

Medical and dental cooperation is essential, if progress along these lines is to be made. Unfortunately certain members of the dental profession are averse to receiving any suggestions from physicians and regard advice on dental matters from medical sources almost as a personal affront, even where the röntgen evidence of advanced oral infection is so pronounced as to be beyond controversy. This spirit is gradually dying out, and most physicians and dentists are now very generally recognizing the principle that the interests of the patient must be paramount to all other considerations.

Figs. 6, 7 and 8 have been reproduced, with the author's permission, from an article entitled "Studies on Elective Localization: Focal Infection with Special Reference to Oral Sepsis," by Dr. E. C. Rosenow. *Journal of Dental Research.* Vol. I, No. 3, September, 1919.

Death by Electricity

By A. H. WERNER, M.D.,

New York.

On the first of March I watched for the first time an execution by electricity, and I satisfied myself that the death sentence carried out by this method was the most humane. Incidentally, I carried out the first step in my research regarding the destruction by electricity of the incitants causing infectious disease. The inoculation of two blood serum-agar tubes remained perfectly sterile. No growth could be detected after incubation for forty-eight hours at a temperature of 37.5° C. If Mr. Ogle, as he has stated to me, can construct an apparatus with which it will be possible to destroy all bacteria in vivo without destroying or injuring the human cell, it will revolutionize the treatment of all infectious diseases, as well as those which are caused by an intermediate host, such as malaria, yellow fever, and sleeping sickness. I cannot imagine that Mr. Ogle, who holds the position of chief electroengineer of the General Electric Company, would make such a statement rashly or without foundation, and I will say here that the profound knowledge which he possesses regarding electricity induced me to take up this matter and, if possible, to carry it to a successful termination regardless of time or expense.

Mr. Ogle has proved to me that he can destroy by electricity in the test tube two of the most destructive incitants, viz., the tubercle bacilli and the spirochæta pallida. The former entirely shrivels up and can only be recognized microscopically because it retains its power to retain the carbol-fuchsin stain;

the luetic spirillum (syphilitic virus) is breaking into several pieces under the influence of the electric current, and therefore we can safely assume that it also has been destroyed. Should electric sterilization of the living incitants in the human body become a fact it would be of great benefit to humanity. Millions of lives would be saved annually and the dread of tuberculosis, cancer and syphilis, which take the greatest toll of human life, would be at an end.

Let me give my impressions with regard to electrical death. In all the medical literature I have never come across a scientific explanation as to the actual cause of death, and I do not assert that my impressions are conclusive, because it is impossible to observe all the physiological phenomena which present themselves in such a short time. The face being covered down to the mouth in electrical execution deprives one of the study of the facial expressions in the moment the electric contact is applied. I will divide my observations into two groups: first, during electrocution and, second, during autopsy.

The person I saw who was to be executed was quite composed, going to take his seat in the fatal chair with a calmness and composure which another person may not even show when sitting down to a dinner at a banquet table. Therefore my observations were not in any way obscured by any unpleasant incidents as otherwise would have been the case.

In bidding everybody goodby the man sat down into the fatal chair, was strapped down, the electrodes fastened to the right leg just above the calf of the lower extremity, and the other to the head in the form of a cap. All this happened simultaneously and occurred in less time than I can describe it. The moment these preparations were ended, and at the end of an expiration, the signal was given to the executioner, and the electric contact was made. I could not notice any distortion of the lower part of the face. The arms and hands which had laid upon the chair rests were turned inside and the hands closed with a jerk and kept close and tense, the thorax was compressed and held like in a vise, and the diaphragm was drawn up to the limit, so that the residuary air in the lungs was forced out with a hiss, like an explosive expiration. The legs became tense, the body was slightly raised as far as the straps would permit and bent backward. The body was held in this position until the current was released, when it slumped down into the chair. On examination by the prison physician, Dr. Squires found the heart fibrillating and the carotid arteries still pulsating, indicating that a second shock would be required. At this stage a severe cyanosis had already set in.

During the second shock the same phenomena could be observed, with the exception that the hands, which up to that moment had been firmly closed, opened and were extended with full force to the utmost. An air bubble was formed in front of the mouth, showing that the air which had reentered the lungs after the current had been shut off was again expelled by the contraction of the whole respiratory mechanism. After about five seconds the current was again cut off. The body became limp, except for the right leg, which was already in rigor mortis. Another examination proved *exitus letalis* and Dr. Squires pronounced the man dead, after which the corpse was immediately removed to the autopsy room.

After the corpse had been stripped I made a general inspection and was surprised to find no burn on the head where the electrode had had contact with the scalp, but a second degree burn on the right leg where electric contact had been made. This burn was quite extensive and was as large in area as the size of the electrode. The corpse was that of an athlete, wellnourished and of strong muscular development. The man was an ex-veteran with a remarkable military record and his physical development was probably due to his military training. The region of the abdomen, the sexual organs and thighs were covered with a heavy growth of hair, which from our knowledge of endocrine function would prove a hyperactivity of the pituitary gland, and which would also account for the act of violence the man committed and for which he had just paid the penalty. Accordingly, the organs of reproduction were more than well developed. This type of man was the antithesis to the type of man suffering from a condition which is known as acromegaly, which is due to a pathological condition of the pituitary body. The body temperature was high above normal and this was especially marked in the right leg and proved to be 120° F. I was informed by Dr. Squires that the temperature in the brain amounted to 138° F. and over, with a slight decrease in the lungs, abdomen and pelvis. The face did not show any muscular distortion. The right leg was held as stated already in rigor mortis at an angle of 45° and the position could not be changed no matter how much force I used. The muscles and tendons were hard in contrast to the rest of the corpse which was limp and not at all affected by rigor mortis. A surprising phenomenon was the abnormal softness and pliability of the finger nails as well as the nails of the toes. After the opening of the thorax and the removal of the sternum, it was found that the left lung and pleura were strongly adherent to the thoracic wall. The adhesions were so strong that it was impossible to break them with the bare hands. A veritable wall of fibrosis had been formed. The surface of the lung on the right side appeared to be of a much darker color than normal and bled profusely when cut into; the smaller bronchi were filled with blood. This man had been shot through the left lung and gassed and therefore I cannot say apart from the fibrosis which changes were due to the electric current or to the gassing and wounding.

The pericardium externally showed nothing abnormal. On opening the pericardial sac, the heart was found to be in diastole, and I was told by Dr. Squires that this was not always the case; in others the heart was found to be in systole. The reason for this can only lay in the fact that electric contact is made just at the moment when the heart was either in one or the other position. On removal of the heart the contained blood therein nearly filled the thoracic cavity, the lungs having been left in situ. The heart itself appeared flabby and not of good muscular tone. The coronary arteries were still distended but no other external sign of degeneration could be detected. In opening the heart, the left ventricle and auricle proved the mitral as well as the aortic valves intact. There was only a slight difference between the walls of the left and right ventricle. On stimulating the cut surface of the heart muscle, nervous reflexes could be observed in the heart by muscular contraction.

This reminded me of an experiment which I made with a human heart after an execution (decapitation) in Germany; placing the heart in a jar of a warm physiological saline solution, the heart so removed from the body kept on beating for over an hour with the same rhythm and alternate action as shown in life. The abdominal organs were found to be normal with the exception of an intense hyperemia, even the mesentery was strongly injected. The organs, except for the spleen, were left in situ. The blood did not coagulate and I was informed that electric shock causes complete hemolysis (destruction) of the red and white blood cells alike. In the meantime, the cranial cavity had been opened and the brain removed; however, not before I had had an opportunity to see that there was a strong hyperemia and that minute hemorrhages had occurred over the whole surface of the brain. The pituitary body was removed and showed no abnormalities. On inspecting the brain we found in the left frontal lobe of the cerebrum an old lesion and slight atrophy probably the results of a pachymeningitis. The brain was steaming hot and the temperature of this organ taken previously revealed it to be not less than 145° F. This must be due to the fact that the brain, as the central organ of the general nervous system, receives the greatest force of the electric shock. The autopsy, which is made simply to comply with the law, was herewith ended, and the body left with the attendants to prepare it for burial.

CONCLUSIONS.

If there must be capital punishment—to which I am strongly opposed for the reason that it is not a deterrent to murder and crime and that as a physician it is my duty and profession to save and preserve life and not to destroy it—let it be by electricity, because, as I have already stated, it is the most humane.

The destructive changes in the body together with the development of the extreme temperature I am satisfied cause instantaneous unconsciousness and death. Death is caused by motor and respiratory paralysis and the extreme high temperature due to electric resistance. The fibrillation (flutter) of the heart after the first shock are simply nervous reflexes, and therefore a revival of an electrocuted person is impossible.

However, the greatest value lies in the discovery of the fact that all bacteria in the body after execution by electricity are destroyed and if we can construct an electric apparatus which will sterilize a man suffering from any disease caused by parasites without injuring the human cell, the greatest discovery in medical science will have been accomplished.

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Subcutaneous Visceral Injuries

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Subcutaneous visceral injuries are not common, yet they are sufficiently frequent and serious enough to merit the most respectful consideration. They are of especial interest to the surgeon, because not infrequently the intestines may be ruptured and the injury fatal, unless operation is performed immediately. Unfortunately, there is no symptom or group of symptoms which can be said to be pathognomonic of visceral injury, yet there are some important differential points which, when properly elicited and assembled in the same case, may lead to a fairly accurate diagnosis.

The gravity of this condition can best be appreciated by a perusal of the mortality statistics reported in the literature. Schmitt (1) finds a mortality of 97.5 per cent. has followed expectant treatment. On the other hand, operation especially early operation, has greatly reduced this mortality, for although every patient with an internal injury is gravely ill from the beginning, yet in most instances is a good surgical hazard. Temporizing measures for the purpose of more accurate diagnosis and localization are inexcusable as the resistance of the individual diminishes with every hour of delay, and the only hope of the patient withstanding any operative procedure is to begin it before he is overwhelmed by a spreading peritonitis. Petry (2) presents a table of forty-two operative cases with a mortality of 67.7 per cent. Lund (3) reports fifteen cases with seven recoveries. Of those who recovered, all were operated upon. Kirstein (4) reports eighteen cases with an operative mortality of 55.5 per cent. Gage (5) reports twenty-nine cases in which operation was performed in the first twenty-four hours, with thirteen recoveries. Of those patients operated upon in the first four or five hours, nearly all recover. The reported mortality of patients operated upon in the first twenty-four hours is forty-five per cent.

Despite the great number of contributions on this subject urging early operation, the following statement appeared in a recent article on this subject by a surgeon of wide experience reporting a case of subcutaneous injury:

"The question of internal injury was carefully considered but with so little shock and no evidence of hemorrhage it was considered best to watch carefully the symptoms before making an exploration." This attitude of watchful waiting in this class of cases for more characteristic symptoms is shared by quite a number of socalled conservative surgeons. Brewer says, "To delay exploration for more characteristic symptoms is to invite disaster."

The usual agents of violence in the production of these injuries are either blunt forces, such as horse kicks, blows from fragments of wood thrown by circular saws, blows from wagon poles and fists, or compression forces, such as the passage of a vehicle over the abdomen. Violence applied to the lower abdomen is more likely to produce visceral lesions than when applied to the upper abdomen, for obvious reasons. The subjacent viscera are damaged by these agents either through direct compression of the organ between the vulnerating force and some bony point, such as the spine or ileum, or, as in the case of hollow viscera, by bursting from within. In compression injuries of the gut, the tears may be complete or incomplete, are usually single, and are to be found underneath the point at which the violence was applied; whereas, in bursting injuries of the intestine, the perforations are usually complete, multiple, and may be situated at a distance from that point.

There are two important factors which determine whether a subcutaneous injury will occur. First, the condition of the abdominal wall—whether thin or muscular, tense or relaxed. A blow received on a tense, expectant muscular abdomen will result most frequently in damage to the abdominal wall alone, producing either abrasions of the skin, ecchymoses, hematoma, or even rupture of the muscles. The viscera will escape in the majority of instances, whereas the same violence applied to a lax abdomen will almost invariably spell disaster for the underlying organs. Second, the condition of the viscera, whether distended or collapsed or, as in the case of the solid organs, the absence or presence of congestion. A stomach or intestine distended with food or gas, or the bladder distended with urine, is more likely to rupture than if empty. An enlarged, congested spleen or a congested, fatty liver is more commonly injured than a normal one. The viscus most often injured is the small intestine—in order of frequency, upper jejunum, terminal ileum and duodenum, because these portions are relatively fixed and for the same reason the cecum and ascending colon are the portions of the large intestine commonly involved. The tears in the intestine are usually located opposite the mesenteric attachment. There may be tears of the mesentery with either free hemorrhage or thrombosis. In injuries to the mesentery of the small intestine, it is well to note the exact location of the damage before deciding upon resection, because of the peculiar anatomical arrangement of the blood supply of the last twelve to fourteen inches of the ileum. Here the vasa intestini tenuis anastomose with the terminal branches of the ileocolic artery, and when the mesentery is injured at this location, it is unnecessary to resect because of this abundant blood supply. This point is illustrated in one of the case reports. The bladder may be torn intraperitoneally or extraperitoneally, and where the injury is due to a crushing force it may be torn in both directions, and is usually accompanied by fracture of the pelvis and may later give rise to extravasation and suppuration. The gallbladder is rarely injured. Of the solid organs, the liver and spleen are more frequently damaged than the kidney or pancreas and they often give rise to severe and at times fatal hemorrhage. Injury to the kidney and pancreas results in retroperitoneal hematoma and later in perirenal suppuration in the case of the former and fat necrosis and cyst formation in the latter. Injuries to the hollow viscera are more amenable to treatment and recovery occurs more frequently than from injuries to the solid organs, because of the severe hemorrhage which usually accompanies the latter.

SYMPTOMS AND SIGNS.

Shock.—In this class of cases shock is not a prominent symptom. In eighty-five cases collected by Gage, it was present thirty-six times. When present, it is trivial and transitory unless the abdominal injury is accompanied by other conditions, such as fracture or severe hemorrhage. Injuries of the upper abdomen show more shock because of the greater hemorrhage which is usually present in these cases. The amount of shock exhibited will depend also upon the temperament of the individual. A nervous, high strung person will exhibit more shock in the presence of a minor injury than will a phlegmatic person who has really suffered a serious one. I recently saw this point well demonstrated. A man who by the proverbial hair escaped being struck by a falling piano showed all the signs of severe shock, viz., cold perspiration, cold extremities, imperceptible pulse, etc., while his less fortunate companion, who was struck by the piano, receiving a crushing fracture of the leg, displayed none at all. According to Keen, even death may occur from shock following a simple contusion of the abdominal wall without any subcutaneous injury.

Pain.—Pain is always present. It is deep seated and is usually accompanied by an anxious, searching facial expression. It is diffuse and radiating.

Vomiting.—Initial vomiting almost always occurs and is of no diagnostic importance, but when it recurs and is persistent, it becomes of differential value.

Tenderness.—Tenderness is invariably present and like pain is deep seated and diffuse.

Rigidity.—Muscular spasm is a most valuable sign of subcutaneous injury. It is present from the outset and is not localized but rather diffuse and gradually increases in proportion to the amount of pressure applied to the abdomen until it becomes absolutely boardlike in character.

Tympany.—This is a late symptom of visceral injury, as is also the absence of liver dullness or the presence of fluid in the flanks. To wait for these signs is a loss of valuable time.

Pulse.—The pulse rate is at first rapid and after reaction becomes slow. An increasing pulse rate is significant of intraabdominal mischief and should be taken at half hour intervals to be of value.

Temperature.—This is of no diagnostic value; at first subnormal, it rises with the onset of peritonitis.

Respiration.—It is usually rapid, shallow, short and distinctly thoracic.

External signs.—There may be signs of trauma to the abdominal wall, such as abrasions, ecchymosis, hematoma, or even avulsion of the abdominal muscles. These are rarely present. The amount of visible damage to the abdominal wall is inversely proportional to the amount of visceral involvement in the great majority of cases. Again, the amount of violence exercised bears no definite ratio to the amount of injury done. Many observers have stressed this point. Eisendrath (6) reports a case of abdominal contusion in which there was a laceration of all the muscles of the abdomen, the muscles being torn away from the iliac crest, resulting in hernia in Petit's triangle without the slightest visceral damage.

None of the foregoing symptoms or signs or any combination of them is absolutely pathognomonic. The chief danger lies in mistaking a visceral injury for a simple abdominal contusion. There are, however, some important differential points which when properly elicited and interpreted are of the greatest value in establishing a diagnosis. Where the injury is limited to the abdominal wall, the pain is superficial and localized to the point of impact of the applied force and is unaccompanied by the characteristic facial expression of visceral involvement. Tenderness is likewise more superficial and localized and is a vastly more prominent symptom in this condition. The patient is literally afraid to have you touch his abdomen. Rigidity is also localized to the traumatized area and is voluntary in character, diminishing in proportion to the increased amount of pressure applied. In contusions of the abdominal wall *per se,* the amount of tenderness by far overshadows the degree of rigidity, whereas in visceral lesions the reverse usually holds true. In this class of cases, the external signs are as a rule very prominent and one may almost axiomatically conclude that the more the abdominal wall is damaged, the less are the subjacent parts.

The cases, whose histories are presented below, came under my care between January, 1915, and December, 1921, and are illustrative of some of the points made in this paper. In all these cases the injury was produced in the same manner, viz., by a piece of board thrown back by a circular saw.

Case I.—A. O., a strong man, aged forty, was feeding a board twelve inches long, four inches wide, and a half inch thick to a rapidly revolving circular saw, standing presumably with his abdominal wall relaxed against the end of the table. Suddenly the saw jammed and the board was slid along the table with great velocity against his abdomen. This occurred at 9 a. m. He fell down, groaned with pain, and in a few minutes was able to get up. He was admitted to the Polyclinic Hospital at about 10 o'clock. On admission he complained of severe pain over the right rectus at the level of the umbilicus. He said the pain was deep and boring and radiated to the back. There was no evidence of shock. He had vomited before arriving at the hospital. There was some tenderness over the lower right quadrant and marked rigidity over the same area. Pulse and temperature were normal, respirations were distinctly thoracic. There was not the slightest visible sign to indicate the point at which the force was applied. He voided clear urine. Operation was offered but the patient refused. When seen again at 12 o'clock, he felt much better, but seemed anxious. The pain was not quite so severe. There was moderate tenderness, but rigidity was absolutely boardlike. At this time he again refused operation, but the condition was explained to his wife and the gravity of delay was impressed upon her and finally, after three hours of persuasion on her part, he consented to operation.

Operation.—At 3:30 p. m., six and a half hours after the injury, operation was performed. An incision over the point of maximum rigidity revealed an abdomen containing blood and intestinal contents. Five small perforations were found in the ileum along the free border and these were turned in. There was also a large rent in the mesentery of the ileum higher up which necessitated resection of about eight inches of the gut with an end to end anastomosis with sutures. The peritoneal cavity was sponged out and drainage inserted. This patient made an uneventful recovery.

Case II.—L. D., male, aged thirty-five years, was struck in the abdomen over the right rectus about a finger's breadth above the level of the umbilicus. This occurred at 11 a. m. and the patient was promptly brought to the Polyclinic Hospital. On admission there were no signs of shock, but he complained of severe pain in the abdomen over McBurney's point which was deep and boring, radiating to the right lumbar region. He had not vomited. Palpation revealed a moderate degree of tenderness over the entire lower right quadrant but marked rigidity over the same area. There was a slight abrasion of the skin at the point where the force was applied. Pulse and temperature and respirations were normal. He voided clear urine.

Operation.—At 1:30 p. m., two and a half hours after the injury, the abdomen was opened and a large retroperitoneal hematura which pushed the cecum forward and inward was found. The parietal peritoneum was incised and the cecum displaced mesially and about two pints of clotted blood were evacuated. The right kidney was pulled down into view and was found to be almost completely bisected, the laceration extending from the outer border to the pelvis. This was sutured and the kidney replaced. Drainage was instituted through a stab wound in the loin and the parietal peritoneum closed. The abdominal incision was closed in the usual manner after carefully examining the intestines which were found to be uninjured. It is interesting to note that although the trauma was applied to the anterior abdominal wall, the only organ damaged was the kidney, the overlying intestine escaping.

Case III.—P. K., male, aged forty years, was injured about 10:30 a. m. and admitted to the Polyclinic Hospital about 11 a. m. On admission there were no signs of shock, but the patient complained of severe pain in right lower quadrant of abdomen, radiating to the back. He had not vomited, and there were no visible signs of injury to the abdominal wall. Palpation elicited tenderness over the entire abdomen, which was moderately distended, and marked rigidity over the lower half of the right rectus. Pulse and temperature were normal, but respirations were short, rapid and thoracic. The patient was distinctly anxious about his condition.

Operation.—At 2 p. m., three and a half hours after injury, operation revealed four small perforations in the ileum along its free border which were turned in. The mesentery of the terminal ileum at about eight to ten inches from the ileocecal valve had a circular tear about the size of a silver dollar. Because of the arrangement of the blood supply to this portion of the intestine, the gut was not resected but the tear in the mesentery was simply sutured and drainage was inserted. This patient likewise made a complete recovery.

Case IV.—C. L., male, forty years old, was struck in the abdomen about a finger's breadth below the level of the umbilicus. He was brought to the Polyclinic Hospital within a half hour of the occurrence of the accident. He exhibited no signs of shock, but complained of severe pain in the abdomen in the region of the umbilicus, radiating back to the spine. There was diffuse tenderness over the entire lower abdomen and marked rigidity over the same area. The patient vomited once, about an hour after admission, and appeared very anxious. Pulse and temperature were normal, respirations short, rapid and thoracic. He voided clear urine. There were no external signs of violence, except a very small streak of redness about two inches long below the umbilicus which indicated the site at which the force was expended.

Operation.—Three hours after admission, the abdomen was opened in the median line below the umbilicus and at first it appeared as though everything was normal but upon more careful examination a loop of ileum about four inches long was found contused with two small perforations opposite the mesenteric border. These were turned in and a drain inserted into the pelvis. This patient made a complete recovery.

Case V.—H. H., male, aged forty-five, was injured about 11 a. m. and admitted to the Community Hospital about 12 o'clock noon. When first seen this patient exhibited a mild degree of shock. He complained of severe pain, boring in character, in the region of the umbilicus, which radiated toward the back and down to the right iliac fossa. Shortly after admission he vomited, after which he reacted from his mild shock. There were no visible signs of injury and palpation elicited tenderness over the entire epigastric, umbilical and right iliac regions. There was marked rigidity over the same areas. Pulse was 70, temperature 97.6°, respirations short, frequent and thoracic. He voided clear urine. This patient appeared very anxious about his condition, but in spite of that refused operation at this time. When seen again at 2:30 p. m. he felt much better, pain was not so severe, vomiting had not recurred, tenderness and rigidity were still present and even more marked. He still refused operation. At 6 p. m. vomiting recurred and became persistent causing considerable distress. This continued until about 7 p. m. when the patient consented to an exploration.

Operation.—At 8 p. m., nine hours after the injury, operation revealed free blood and intestinal contents in the peritoneal cavity. There were three large rents in the ileum along the free border which were turned in and a very large tear in the cecum from which intestinal contents gushed out into the peritoneal cavity in large quantities. This opening was closed, drainage was inserted, but despite these efforts this patient died of general peritonitis on the fourth day postoperative.

Case VI.—J. R., male, aged forty-eight, was injured about 2 p. m. When seen half an hour later he showed evidence of shock (cold perspiration, rapid pulse, extreme pallor, etc.), and complained of severe pain in the epigastrium. The pain was localized to an area about the size of a quarter, just above the umbilicus which was marked by an abrasion of the skin. There was extreme localized tenderness about this abraded area and rigidity was limited to the same location. Here tenderness was by far a more prominent sign than rigidity. He was admitted to the Community Hospital for observation. He did not vomit but gradually reacted from his shock and the pain likewise subsided gradually. At the end of twenty-four hours most of his complaints disappeared with the exception of tenderness which persisted and ecchymosis appeared at this time over the same area. After forty-eight hours of observation, this patient was discharged.

Case VII.—J. E., male, aged thirty-two, was injured at 2:30 p. m. and when seen half an hour later exhibited a moderate degree of shock and complained of severe pain in the abdomen and the region of the umbilicus. The pain was localized to an area about the size of a silver dollar across which ran a lacerated wound about two inches long. There was a swelling (hematoma) surrounding this laceration about two inches in diameter. Palpation elicited extreme tenderness and rigidity both well localized. Pulse, temperature and respirations were normal. There was no vomiting. The patient was admitted to the Community Hospital for observation. An ice bag relieved the pain and the following morning the patient was entirely well, with the exception of extreme tenderness of the contused area. Ecchymosis appeared over the entire lower right quadrant of the abdomen and in twenty-four hours the patient was discharged.

In the first five cases the most important points, upon which the indication for an exploration were based, were the history of the injury, thoracic breathing, anxious facial expression, moderate tenderness overshadowed by the extreme rigidity (not localized), plus the absence of external signs of violence.

In Cases VI and VII extreme localized tenderness was far more prominent than the degree of rigidity and the external signs of violence were also very conspicuous. Case IX shows the difficulty of diagnosis in this class of cases. This patient was able to walk to the hospital, return, and continue at work for four hours, and travel in a crowded train for an additional hour before finally being forced to go to bed with some evidence to justify a probable diagnosis.

CONCLUSIONS.

1. All information regarding the traumatizing agent should be collected.
2. The amount of violence bears no definite ratio to the amount of injury done.
3. The more the abdominal wall is damaged, the less are the subjacent parts.
4. A diagnosis can in the majority of cases be made and to be of any value it must be made before characteristic signs appear.
5. No one sign or group of signs is absolutely pathognomonic.
6. In injuries to the abdominal wall extreme localized tenderness is the most prominent symptom and overshadows the degree of rigidity; the reverse holds equally true in injuries to the viscera.
7. Shock is not an important symptom in this class of cases.
8. The most important signs and symptoms in the order of their diagnosis value are first, rigidity followed by increased shallow breathing in the absence of distention, anxious facial expression, diffuse tenderness, deep seated, radiating pain, vomiting and shock of a varying degree.
9. The prognosis is better in injuries to the hollow

viscera, and the higher up along the intestinal track the better the prognosis.

10. Incision should be made over the point of maximum rigidity.

11. When in doubt operate, and if no visceral lesion is found, the danger to life in such an event is exceedingly small and is not to be weighed against the possible life that may be saved in many a case.

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*Cases VIII, IX and X and the bibliography will appear in the author's reprints.

Social and Public Health Aspects of the Gonorrhea Problem*

By ALEC. N. THOMSON, M.D.,
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The problem of gonorrhea control naturally divides itself into three groups: national, state, and local. Nationally, there was never much enthusiasm or backing until the great war. Then the American Social Hygiene Association which had been active prior to the war, seized its opportunity and impressed upon the Army and Navy the necessity for combating the socalled venereal diseases. With greater difficulty the interest of the United States Public Health Service was aroused. Eventually, in the national field there came into existence two governmental agencies, the Venereal Disease Division of the Public Health Service, and the Interdepartmental Social Hygiene Board, and one voluntary agency, the American Social Hygiene Association. Unfortunately, neither type of national agency evidenced much interest in the medical phase of the control of gonorrhea, unless the desire for clinics and more clinics may be so interpreted.

In 1920, the United States Public Health Service established a conference or institute, as they called it, for the study of venereal disease, and at this, medical matters did receive a fair amount of consideration, although syphilis rated more attention than did gonorrhea. The All American Conference on Venereal Disease was held the week immediately following the institute of the Public Health Service. In many respects we may consider the All American Conference in December, 1920, as having given us a statement of principles upon which we can build in combating venereal disease, and in attempting to lay down a constructive plan for more active work in the field of gonorrhea.

In the individual states it may be said that practically every department or board of health recognizes the control of venereal disease as one of the essential functions of its communicable disease campaign. Most of the states find the problem of sufficient importance to make a separate bureau or a separate division of a bureau responsible for venereal disease control work. The reason for separate divisions or departmental units is the complexity of the subject. It is not simply a medical matter. It includes education, environmental control, supervision of patients, maintenance of hospital and clinic, and close cooperative contact with the medical profession. Almost all the states have made efforts in practically every field, and have done a large volume of educational work with the printed page, motion pictures, stereopticon slides, and other means of publicity, including exhibits along the line of the anatomical museum.

The medical activities undertaken have largely been confined to the provision of better diagnostic facilities for the physician, and advice and sometimes diagnostic service for the layman. The states generally recognize the necessity for the provision of free diagnostic and treatment service for those unable to afford private service, and have contributed a good deal of money in the earlier stages of the campaign to establish clinics. Appropriations available for clinic subsidy have been cut down in most every state and in a number have been cut out. The communities, however, have been taking over the newly established clinic activities. Gonorrhea and syphilis are reportable diseases in one way or another, in every state in the union. Only nine require reporting by name. New York State has been active above the Bronx; has conducted a very extensive educational campaign for the public; has provided the medical profession with the Massachusetts General Hospital case reports in so far as they have related to either gonorrhea or syphilis; has extended its laboratory service and done an essential and creditable piece of work. But the New York State Health Department's activities do not come into our own city of greater New York.

In the cities of the country we find the same general distribution of activities, and also that the control measures have only recently assumed a position of relative importance in municipal health matters. In 1913, only twenty-eight cities out of 227 of the largest cities in the country made any effort at control of gonorrhea, and most of this effort was on the line of free laboratory diagnosis for the physician who was unfortunate enough not to own a microscope and some methylene blue. In 1921, a study of eighty-three cities was made, and there are some interesting comparisons:

In 1921, all but two of the eighty-three cities had clinics for free treatment of venereal diseases. In 1913, only four cities had them. In 1921, custodial and hospital care was available in at least thirty-eight of the eighty-three cities for the quarantine of patients refusing treatment. In 1913, hospital care was given to dangerous cases in but three cities. In 1921, examinations were given to food handlers in thirty-seven cities, and infected persons were obliged to seek treatment in order to secure working permits which were refused until the disease was rendered noninfectious. In 1913, such a law was in force in only one city. Of the eighty-three cities studied, reporting is in existence in all. Isolation and quarantine is not particularly easy, although in our own city it is decidedly a feature. Work is being carried on for the control of sex offenders, and the detection of dangerous carriers in quite a general way throughout the country. As a general thing, city health departments are offering better facilities for diagnosis of diphtheria, typhoid, scarlet fever, and tuberculosis than they are for gonorrhea and syphilis. New York City is particularly fortunate in this regard.

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*Read before the Section of Genitourinary Surgery, March 21, 1923.

When it comes to clinics, we find that eighty-one out of the eighty-three cities studied have venereal disease clinics. It is interesting to note that the two cities without the clinics are really parts of Boston, and the patients go to the four or five clinics maintained in that city. In most of the cities, the health departments do not maintain all the clinics necessary to take care of the venereal disease work in the community, but follow the procedure which we have here in New York of clinics maintained by municipal or private hospitals. Many cities are maintaining clinics similar to the advisory clinic conducted by the New York City Health Department. A few of the cities maintain more than one clinic entirely as a health department function. Obviously, as in New York, municipal clinics may be maintained in hospitals not under the jurisdiction of the health department, as in the case with us in Bellevue and allied hospitals, and public welfare institutions. Speaking particularly of clinics maintained by health departments, it may be generally said that it is not being done to any great extent. The entrance of the health department into the field of treatment except when essential to quarantine is still being debated.

As nearly as can be ascertained, the per capita cost to the population for treating patients in venereal disease clinics ranges from one to five cents, with an average of two cents, while the cost per patient varies all the way from $2.30 to $27.00. All of which means that cost accounting in these clinics is not comparable. It may be just as good health protection for one community to spend $27.00 to clear up the occasional case in a small clinic with high overhead expense as it is for the large cities with a large clinic population and the same overhead to be giving treatment at low cost. On the other hand, there is one figure that can be reasonably measured, and that is the average per capita expenditure by community health departments for venereal disease control, which is about two cents. Some cities run as high as fourteen cents while New York City spends two tenths of a cent. The average per capita spent on gonorrhea and syphilis is one half of the average per capita spent on tuberculosis. If the propagandist is correct that there is as much syphilis as tuberculosis, and you add upon this all the gonorrhea that needs attention, then the community should be spending at least as much for the handling of the socalled venereal diseases as it now spends for tuberculosis, a disease which has apparently been declining since the discovery of the tubercle bacillus.

In New York City, a great deal has been and is being done in attacking the problem. Some ten years ago there was established in the health department as a demonstration, a diagnostic and advisory service for those afflicted with gonorrhea and syphilis. Following this, considerable effort was made to combat the quack with the passing of prohibiting legislation as far as advertising was concerned. The diseases were made reportable, and in 1917 it became "the duty of every physician to furnish and deliver to every person found by such physician, to be affected with syphilis or gonorrhea, a circular of instruction and advice, issued or approved by the Department of Health of the City of New York, and to instruct such person as to the precautions to be taken in order to prevent the communication of the disease to others."

During the past year the health department has issued new instruction leaflets on both gonorrhea and syphilis. The process by which these were written illustrates what we believe to be one of the essential factors in progress towards the better control of gonorrhea, namely a cooperative effort by the health department on the one hand, and the profession as represented by clinicians who are active in the dispensaries of the city, on the other. The health department in announcing these new publications said:

"The readers of the *Weekly Bulletin* will be interested to know that the circulars giving advice and information about gonorrhea and syphilis, which, according to law, must be issued by every physician in dispensary or private practice to persons suffering from these diseases, have been radically revised by a joint committee representing the Venereal Disease Section of the Associated Outpatient Clinics of the City of New York, and the Bureau of Preventable Diseases.

"The new circulars express not only the judgment of the officers of the Bureau of Preventable Diseases, but of a group of specialists in venereal diseases who represent all of the officially recognized venereal disease clinics of the City of New York. It is hoped that these new circulars, representing as they do the judgment of such authoritative workers in this special field of medicine, as Dr. Edward L. Keyes, Chairman of the Section on Venereal Disease, Associated Outpatient Clinics; Dr. Louis Chargin, Chief of the Division of Venereal Diseases, Department of Health; Dr. Alec N. Thomson, Executive Secretary, Section on Venereal Diseases, Associated Outpatient Clinics; Dr. D. D. Stetson, Chief, Syphilis Department, Skin and Cancer Hospital, and Dr. J. S. Read, Genitourinary Department, Long Island College Hospital, will serve a useful purpose in instructing patients and others who need to be advised about these diseases.

"The department of health has on hand a supply of these circulars, and will distribute them to patients attending its clinics, as well as to private physicians, hospitals and dispensaries. If any of the institutions desire to have an extra supply of these circulars, they may print copies of the official circular, or prepare a circular of their own which must, however, receive the approval of the department of health."

Cornell Clinic, New York Hospital, and Brooklyn Hospital have reprinted this. Every physician should provide himself with the pamphlets, to comply with the law, and do a definite piece of control work.

The sanitary code says that no public dispensary where communicable diseases are treated or diagnosed shall be conducted or maintained otherwise than in accordance with the regulations of the board of health. Under this section of the Code, regulations governing the conduct and maintenance of clinics handling gonorrhea have been laid down and printed.

Recently in an attempt to measure the practicability of these regulations, and also to ascertain how far they were being met, we circularized the institutions where we believed gonorrhea was being treated in either genitourinary, neurological, gynecological or pediatric service. We found that the clinics vary remarkably. As a matter of fact, the probability is that none of the clinics are able to comply with such hard and fast standards. In an attempt to improve the service being rendered, the Associated Outpatient Clinics of the city, through its venereal disease section is proposing to cooperate with the health department in revamping these regulations under the sanitary code. In the institutions with which you are connected there is one individual at least who is the appointed delegate of your organization to the Associated Outpatient Clinics.

Many things remain to be done. Clinics need to be improved; physicians need to consider gonorrhea as one of the more serious diseases. The jocular attitude of ten years ago is passing; is almost past. The old clap clinic is no more. Gonorrhea is being treated. Unfortunately, this is true only of gonorrhea in the male. It is doubtful whether many of the clinics in the city of New York which might come in contact with gonorrhea in the female are paying even enough attention to the subject to know that they are coming into contact with it. One of the physicians working in an institution recently stated that in the last five thousand women examined in the gynecological department, three cases of gonorrhea were found. Another leading gynecologist made the statement a couple of years ago that he thanked God that in ten years he had not seen a case in private practice. It was not so many years ago that the genitourinary surgeon, now the urologist was saying almost the same thing about gonorrhea in the male.

May the day soon come when the Gram negative diplococcus which morphologically resembles the gonococcus will no longer be a neglected inhabitant of the mucous membrane!

15 West Forty-third Street.

A Comparative Study of the Results Obtained by Counting Specimens of Blood with the Einhorn-Laporte and the Thoma-Zeiss Methods*

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Examination of the blood has attained great significance in the clinical pathology of most diseases. The result of a blood examination, especially in internal medicine, has a great influence upon diagnosis. Frequently it is impossible to make accurate counts of the red and white blood cells at the patient's bedside, whereas it is always easy to make cover slip specimens which may be examined later.

Several years ago Einhorn and Laporte (1) devised a method of counting the red and white blood cells in stained specimens. As this method was practical, accurate, and at the same time simple, the idea occurred to us to compare the results obtained by this method and the Thoma-Zeiss method (3).

We obtained the specimens of blood for the two counts at the same time. Then one of us counted the blood by the Einhorn-Laporte method and the other by the Thoma-Zeiss method. We counted the blood in forty-nine cases and proceeded as follows:

In each case the blood under the necessary precautions was first drawn into the red and white pipettes of the Thoma-Zeiss apparatus. Then cover glass preparations were made according to Ehrlich (2). One of us (S.) determined the number of red and white cells according to the Thoma-Zeiss method. The other (R.) counted the blood by the Einhorn-Laporte method.

In making the cover glass specimens no pressure should be exerted to force the blood from the puncture, but it must flow out freely just as it should for use in the mixing pipettes of the Thoma-Zeiss apparatus. All the precautions essential to a good spread as given by Ehrlich should be scrupulously observed in the distribution of the blood between the cover glasses, namely a very thin carefully cleansed cover glass, not too large a drop, and other technical details. In the same manner the blood must be spread out evenly between the cover glasses by means of capillarity without the exertion of any pressure.

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*From the Lenox Hill Hospital, New York.

If all these necessary precautions are taken specimens suitable for subsequent examinations are obtained. The specimens are stained by Jenners stain.

Starting from the supposition that in carefully prepared specimens, the distribution of the blood elements will vary correspondingly according to their number, we decided to count all the red as well as all the white corpuscles in a certain area of the dry specimen and to compare the results thus obtained with those by the Thoma-Zeiss method. As the unit of the square area counted we have taken a square millimeter. The number of red and white corpuscles contained in a square millimeter is calculated from the fields counted multiplied by a certain constant factor and the result is then compared with the number of red blood cells contained in one cubic millimeter as described by the Thoma-Zeiss apparatus.

TECHNIC.

For making this determination we have found a medium power dry objective (D D or E of Zeiss or 5, 6 or 7 of Leitz) with a weaker and a stronger eyepiece most practical. We used objective D D and eyepiece 2 and 4 of Zeiss. With objective D D and eyepiece 2 the whole visual field comprised 0.23 square millimeters. The field area can be easily determined for each objective and eyepiece according to the well known algebraic formula, which makes the square area of a circle equal to R^2 where $\pi = 3, 1,415$ and R=radius of circle. The radius of the visual field is determined by means of a fine stage micrometer or the divisions in the Thoma-Zeiss counting chamber.

Objective D D and eyepiece 2 we used only to count the leucocytes in the whole field. As it would be impossible to count also the more numerous red cells in so large a field, we contented ourselves by counting a certain fraction of the whole field. For this purpose we used the same objective D D but with eyepiece 4, into which for further reducing the field we inserted a glass diaphragm engraved in the centre with a large square, which again is subdivided into four equal squares. This diaphragm is similar to the one used by Einhorn and Laporte but is a circular piece of glass made so as to fit into the ocular of the microscope. The rulings on this glass are the same as used by these authors in their work.

COUNTING.

After preparing the cover glass specimen and selecting a suitable area, we count with objective D. D. and eyepiece 2 all the leucocytes visible in the field. After changing eyepiece 2 for 4 into which we have placed our blood counting diaphragm, all the erythrocytes visible in the entire square aperture or some part of it are counted. Now reinsert eyepiece 2 and move the slide for the width of one field. This procedure is repeated until about six square millimeters (twenty-five fields) have been counted. From these figures the number of leucocytes and erythrocytes in one square millimeter of the cover glass specimen is calculated. The number of leucocytes in one square millimeter is found by simply dividing their total number counted by the number of square millimeters counted. With the reds we proceed in a similar manner except that we have to multiply the resulting quotient by the number which indicates how many times the entire field of eyepiece 2 is larger than that of the field embraced by the square aperture of the blood counting diaphragm in eyepiece 4. In our case this number was 20.3.

All we have to do now in order to obtain the number of corpuscles in a cubic millimeter is to multiply the numbers counted in one square millimeter by the average factors (500 for the red and 400 for the white cells).

Below we have appended a table of forty-nine cases. These cases represent the counts by the Einhorn-Laporte and the Thoma-Zeiss methods respectively.

In making a blood count the personal equation plays an important part in the result. A marked difference will occur when two persons draw blood from a patient and make two separate counts by the same method. Again, a blood count made by the Thoma-Zeiss method will rarely give the same result even if the blood should be drawn at the same time and counted by two persons as Table II shows. Therefore, there is sure to be a difference between the result obtained by counting the blood by the two methods. But the variation is not on the whole any more than would be if separate counts were made by two persons at the same or different times and counted by the same method.

In going over Table I, it will be seen that the difference in the white blood cells between these two methods is as follows:

In twenty-six cases there was a difference of less than 1000.
In eighteen cases there was a difference of 1000-2000.
In five cases there was a difference of 2000 or more.

The red blood cells vary as follows:

In thirty-eight cases there was a difference of 50,000 to 250,000.
In eleven cases there was a difference of over 250,000.

CONCLUSIONS.

In comparing the Einhorn-Laporte method of counting specimens of blood with that of the Thoma-Zeiss, we find the former has these advantages over the latter:

In the Einhorn-Laporte method the blood specimen can be taken at the bedside and counted at leisure. It is a rapid, accurate and very convenient method. It can easily be done by every physician without the need of a special blood counting apparatus. The differential count can be made from the same specimen at the same time.

TABLE I.

No.	Pt.	R Einhorn-Laporte Method	S Thoma-Zeiss Method
1.	M.	9,100	10,800
		4,275,000	4,760,000
2.	Z.	16,200	13,600
		4,800,000	5,592,000
3.	B.	11,800	9,000
		4,490,000	4,924,000
4.	S.	7,200	6,000
		3,900,000	4,576,000
5.	B.	9,000	8,800
		1,800,000	2,030,000
6.	R.	5,200	4,800
		1,590,000	1,968,000
7.	S.	6,000	4,600
		4,900,000	5,200,000
8.	T.	16,400	18,200
		4,320,000	4,440,000

No.	Pt.	R Einhorn-Laporte Method	S Thoma-Zeiss Method
9.	L.	29,000	28,200
		4,800,000	5,100,000
10.	T.	10,200	9,400
		4,300,000	4,376,000
11.	S.	20,100	19,800
		4,950,000	5,000,000
12.	A.	11,200	12,400
		4,600,000	4,800,000
13.	K.	6,400	6,500
		4,500,000	4,600,000
14.	K.	10,000	9,600
		4,780,000	4,100,000
15.	D.	10,000	9,200
		5,100,000	4,800,000
16.	T.	16,100	14,900
		5,100,000	4,500,000
17.	M.	15,100	14,000
		4,800,000	5,100,000
18.	B.	18,600	19,800
		4,100,000	4,400,000
19.	C.	12,500	12,600
		4,200,000	4,150,000
20.	O.	18,200	18,000
		4,230,000	3,900,000
21.	N.	4,000	3,600
		4,800,000	4,900,000
22.	B.	10,000	9,400
		4,600,000	4,200,000
23.	K.	14,000	14,400
		3,600,000	4,400,000
24.	B.	12,900	14,400
		4,209,000	5,100,000
25.	W.	12,000	11,200
		3,800,000	4,020,000
26.	D.	10,100	9,000
		3,850,000	3,600,000
27.	V.	9,200	8,200
		4,350,000	4,104,000
28.	C.	8,200	6,400
		4,900,000	5,400,000
29.	M.	10,000	8,200
		5,200,000	4,900,000
30.	C.	6,800	6,000
		1,200,000	984,000
31.	A.	9,800	11,400
		4,900,000	5,000,000
32.	S.	7,000	7,400
		3,800,000	4,100,000
33.	D	13,400	12,600
		4,800,000	5,200,000
34.	O.	9,200	8,000
		5,400,000	5,600,000
35.	L.	24,500	26,000
		3,900,000	3,750,000
36.	R.	11,000	10,200
		4,800,000	5,100,000
37.	L.	10,400	8,200
		4,500,000	5,200,000
38.	D.	19,000	16,200
		4,200,000	4,300,000
39.	T.	14,000	10,200
		4,200,000	4,900,000
40.	R.	13,200	14,600
		4,900,000	4,440,000
41.	C.	14,300	15,000
		4,600,000	4,800,000
42.	B.	12,000	11,200
		4,890,000	5,000,000
43.	Z.	11,000	10,800
		4,080,000	4,800,000
44.	M.	11,100	10,300
		4,500,000	4,900,000
45.	L.	20,100	18,400
		3,950,000	3,500,000
46.	S.	23,100	24,000
		3,100,000	2,500,000
47.	H.	18,100	17,200
		4,100,000	3,700,000
48.	D.	14,500	13,600
		3,900,000	4,600,000
49.	M.	11,800	12,000
		4,900,000	5,000,000

TABLE II.

BLOOD COUNT MADE BY THE THOMA-ZEISS METHODS.

	Dr. R.	Dr. S.
1.	8,200	9,100
	3,800,000	4,000,000
2.	14,800	15,000
	5,000,000	4,800,000
3.	21,800	20,000
	3,900,000	4,200,000
4.	6,200	7,200
	4,950,000	4,500,000
5.	10,500	10,000
	3,500,000	3,800,000

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1. EINHORN AND LAPORTE: A New Method of Approximately Estimating the Number of Blood Corpuscles from Stained Specimens, *Medical News*, April, 1902.

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Report of Glandular Dysfunctions in One Family

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New York.

The following family history is reported not because it is unusual to find many glandular dysfunctions in the same family, but because it is rather unusual to find such endocrine embalance in practically an immediate family.

The father, an American of English descent, married two sisters, also American and English descent. By the first wife he had two daughters and two sons. The daughters married, one twice, and both remained sterile. One son showed criminal tendencies, absconding with a large sum of money. His marriage was also sterile. The second son, a typical cretin, lived to the age of thirty with most marked cretinoid symptoms as to features, skin, stature and intelligence. By the second wife he had three daughters. The wife herself died of diabetes. The oldest daughter only attained a height of five feet, suffered with scant, irregular menses and had such marked hirsuties that she was forced to shave daily. The two younger daughters became very obese, married and both proved sterile. I regret being unable to trace the family tree back to previous generations.

This family then shows marked uniglandular as well as pluriglandular dysfunction. The pancreas in the diabetic mother, the thyroid in the cretin son, the pituitary, gonads, pineal, and the suprarenal cortex one or more, in the remaining members of the family.

Editorial Articles

THE VALUE OF VACCINATION

If any form of treatment or prevention has been proven beyond a doubt it is vaccination against smallpox. The evidence in support of vaccination from all parts of the world is so overwhelming as to admit of no argument, and yet in some civilized countries and especially in Great Britain where the method was discovered and introduced there is a considerable amount of scepticism as to its beneficial effects in both preventing smallpox and modifying its virulence, and indifference among a large proportion of the population as to its value. The educated persons who prate glibly of the misconceived views which have arisen concerning the efficacy of vaccination and attribute the subsidence of the disease and the apparent alteration of type to improved sanitation, hygiene and so on and who declare that vaccination has been a negligible quantity in this practical abolition of the dread malady are, speaking frankly, mischievous. They lead the ignorant, and the mass of the population are supremely ignorant of medical matters, astray to the menace of the entire community. When vaccination has not been in force for a long period, there are a large number of persons who are not protected against it, and if infection is abroad are apt to contract a virulent form and moreover to spread it. Vaccination, therefore, should be made compulsory for the sake of the public at large and the ignorant led away by specious argument must not be allowed to be an ever present source of danger to a nation.

Liberty, freedom, and individualism are excellent when used with discretion, but when these watchwords are employed to be abused and everyone is permitted to use his own judgment, or lack of judgment, at the expense of his neighbors, it is time to call a halt. Recently Sir Patrick Hehir, a retired major general in the medical service of the British Army in India, has contributed some most instructive data on the value of vaccination in India and in the Near East which supply a striking object lesson upon he theme of this editorial. In a communication he made a short time ago to the lay press of London he said in part that as health officer of a large municipality in a native state in India for a period of ten years (1887-97) he came into contact with much smallpox, and had a great deal to do with vaccination. n 1888, in an official report he represented that about wenty per cent. of the community were disfigured, or had lost one or both eyes, or were deaf, from the effects of smallpox. Epidemics that ran into thouands of cases used to occur. By 1897 the disease was almost eradicated from that municipality solely by compulsory vaccination, systematically carried out. It may also be added that smallpox is practically always present in an epidemic form in the civil population in one or more districts in India, yet it never occurs epidemically among Indian troops, chiefly because every native soldier must be vaccinated as a condition of his recruitment.

During the first half of the present year Sir Patrick Hehir, when working for the British Red Cross Society in Greece, saw somewhere in the neighborhood of eight hundred cases of smallpox in refugee infectious diseases hospitals and in the Red Cross Hospitals. To all intents and purposes these cases occurred in adults who had not been vaccinated and children who had never been vaccinated. It was not until nearly the whole of the refugee population had been compulsorily vaccinated that the disease was got in check.

It is also pointed out that the old arguments that used to be advanced against vaccination when it was carried out on the socalled arm to arm system, can no longer be maintained. Vaccine lymph is now in almost all instances obtained from healthy calves. Personally Sir Patrick Hehir has been vaccinated five times, twice successfully. It has fallen to his lot to have been brought into contact with many thousands of smallpox cases. He has never had the disease.

The testimony in support of vaccination must convince any but the most prejudiced or ignorant of its efficacy. Of course, improved sanitation and hygiene generally have been favoring contributory causes in the doing away with smallpox, but it is certain that vaccination is the main factor in a successful campaign against its spread. In India, for instance, sanitation is at a very low ebb, although, no doubt, slightly improved, and this goes to show that in the district in which Sir Patrick Hehir was health officer vaccination was the method which virtually eradicated the disease. Again among the refugees in Greece, sanitary and hygienic conditions were low and smallpox flourished abundantly until compulsory vaccination checked it. But there is no need to dwell further on the point and especially to medical readers, that vaccination properly done is the only sure means of wiping out smallpox. However this may be said, is it right that the population at large of a country should be made to suffer or likely to suffer because of the views of a few cranks and because of the ignorance of medical matters, comprehendible of course, of the many? An educational campaign on several diseases might and undoubtedly would prevent a great deal of sickness both acute and chronic. In fact, vaccination and smallpox show up this fact most strongly and point the moral that vaccination should be made compulsory and universal and that education on medical matters should be carried on by those who know more widely than at present.

HOSPITAL CARE OF PATIENTS

Little or no thought has been given to the problem of the hospital care of patients suffering from chronic diseases, in spite of the fact that the last thirty years have witnessed a great improvement in the standards and policies of the general hospitals. The series of articles dealing with the institutional care of sufferers from chronic disease, that has recently appeared (The Proper Institutional Care for Patients with Chronic Diseases, Ernst P. Boas, *The Modern Hospital,* November, 1922, and Present Institutional Facilities for Care of Chronic Diseases, Ernst P. Boas, *The Modern Hospital,* November, 1922, and July, 1923), is, therefore, quite timely.

Of fundamental importance is the classification of the inmates of such institutions according to the care which they demand. The author points out that they may be grouped into three categories: Class A—those requiring medical study for diagnosis and treatment; Class B—those requiring nursing care only; Class C—those requiring custodial care only. The classification is important because it brings to mind the different institutional facilities demanded by each group. Class A patients are entitled to all the resources of a general hospital; Class B patients should command an excellent nursing service, controlled by a conscientious medical staff; Class C patients require only custodial care and are retained in the hospital for economic, not for medical reasons. They remain because poverty prevents their relatives from receiving and caring for them.

The institution caring for patients with chronic diseases, therefore, must be prepared to give three types of service and must consciously plan its organization accordingly, if the patients are to be properly cared for and if the institution is to be economically conducted. The final paragraph sums up the author's conclusions: "Such hospitals must be equipped with all of the facilities of a general hospital. They should retain in their wards only such patients who need active medical and nursing care. In connection with such hospitals there should be a separate pavilion for purely custodial cases. A method of free transfer between the two departments of the institution should be established. A home for incurables should have no independent existence without immediate access to complete hospital facilities."

MALARIA AS A REMEDY

While malaria is allowed to be the most destructive and devastating disease known, it is now said to possess certain therapeutic virtues. It is a matter of common knowledge gained by experience that patients suffering from progressive paralysis, a late stage of syphilis, when seized with an acute affection accompanied by high temperature, improve. This fact suggested to Professor Wagner-Jauregg, of Vienna, that it might be beneficial to inoculate such patients with the germs of malaria. This was done, and after some eight to ten attacks of fever had been undergone, the malaria was stopped with quinine. In a lecture recently delivered in Vienna, it was stated that cases thus treated in good time which had not been favorably influenced, in the least, by salvarsan, resulted in an improvement lasting for years and even in rehabilitation for work. It seems, however, that the importance of this treatment rests chiefly on the question as to which centre of the brain is affected by the stimuli of syphilis. If an essential part of the brain is injured, although the paralysis may be stayed, of course, there is no cure.

The claim is made, that since 1919, three hundred cases have been treated in this manner at the Wagner-Jauregg clinic. It is further declared that owing to the new method the number of paralytics who have to be nursed at asylums has declined. It appears that the main aim of this mode of treatment is to eradicate syphilis during its early stage by artificial malaria so as to prevent paralysis which may break out later.

Professor Wagner-Jauregg method is being practised at the Steinhof which is the second largest lunatic asylum in the world.

More must be learned of this revolutionary method of treating syphilis and a great deal more experience must be gained and accurately recorded ere it can be regarded and employed as an effective means for preventing or favorably influencing progressive paralysis.

POSTOPERATIVE PNEUMONIA

Postoperative pneumonia cases are all too common and many of them could be prevented with a little more forethought and care. When we consider one little custom of hospital practice it would seem nigh miraculous that pneumonia, whether postoperative or as a complication in a medical case, is not more common. That custom is the placing of a patient, who has just come from a warm bed to which he is accustomed, in several warm blankets—in one blanket of routine hospital accommodation or possibly two. The hospital supply may be theoretically ample, but from nationality, family, custom, and individual nature patients cannot all be treated alike. Chilling of the body is still, as it has always been, the antecedent of colds and of pneumonia, and when a bath, none too carefully administered, and a few hours in bed with insufficient or unaccustomed clothing, is followed by the shock of an operation, the wonder is that pneumonia does not develop more frequently.

Carelessness in the washing of a patient after operation so that his wrappings are soaked and he is not completely dried before going to the recovery room is a source of chill. The recovery room treatment may lead to pneumonia and a successful surgeon has recently called our attention to the danger from too prolonged treatment for shock by external heat, and there is probably very much truth in his assertion. Possibly the operating room is often warmer than is good for the patient, with all his wrappings. Does anyone know how warm an operating room should be? We doubt whether the matter has ever been studied. But many postoperative pneumonias are really preoperative pneumonias which a careful examination would have disclosed. A surgeon of our acquaintance recently operated upon a hernia in a case in which the operation might have been delayed indefinitely except that delay added to compensation outlay. An examination of the chest revealed some râles, but the man was vigorous and the surgeon took the risk. The patient died within a few days of pneumonia.

Postoperative pneumonias are frequently attributed to the action of the anesthetic, but if this were the true cause such outcome ought to be much more frequent than they are. It may be that the anesthetic is often a factor, but it probably is of slight importance compared with other conditions, some of which we have mentioned.

EXCESS WEIGHT

Time was, and not long ago, when weight above normal in the adult was believed (except in extreme cases) to be a protection rather than a harmful condition, while underweight, at any age, was considered significant of increased tendency to premature mortality. Just the opposite is the view now held by the ,insurance companies with regard to heavy weight in adults, and they tell us that those who have reached the age of thirty and who are below the average weight for their height have a decided advantage in the race for length of days.

Were the statisticians wrong in their assertions of a few years back, or were they simply following the common notion that because one is well padded he must be in excellent health? It is barely possible that the near disappearance of typhoid fever as a frequent cause of death and a source of life long injury to ten times as many persons as it killed, may have brought about the change of view and actual change in the showing of statistics. At any rate it was held, and doubtless with good ground, that a person furnished with a superabundant stock of internal provision for a siege of sickness in the form of typhoid infection was much better prepared to weather it than your individual of normal or of subnormal weight.

It stands to reason that unless excess fat is an aid in infections (and certainly in our present day most common and most fatal infection—pneumonia, it is not an aid) it ceases to be of any apparent benefit. On the other hand the mere carrying around, day after day, of fifty, twenty or even five extra pounds of weight means so much more wear and tear on the locomotor machinery and, in particular, upon the heart. We would consider it absurd to carry all day a five pound weight in our pocket, or one pound in each of our five pockets, but five pounds of fat, though more widely distributed, is just as heavy. Is it any wonder that socalled heart failure is of frequent occurence, especially if that heart is already weakened by infection. Excess weight means also excess feeding, excess work on the part of the kidneys, and, sooner or later, poisoning of tissues by a lymph that cannot always be kept normal. There is every physiological reason why the present teachings of the actuary in regard to heavy weight in persons in adult life, should be true.

THE PATHOLOGY OF PHLYCTANULAR CONJUNCTIVITIS AND KERATITIS

Ivanoff, in 1869, was the first to describe the pathological histology of phlyctanular keratitis and conjunctivitis, but the process has been given much study so that at present the histology is fairly well known. The epithelium, according to Leber, is simply raised up and decreased in thickness from the periphery to the centre of the nodule. It becomes strongly infiltrated with leucocytes and then its limits with the mucosa upon which it rests become more and more ragged, infiltrated as it is by these elements. At the centre of the nodule the epithelium is changed and to all appearances in a state of passage to necrosis. The protoplasm is very stained, while on the contrary, the nuclei are less so and are irregular; the cells are flattened and placed in irregular order. Therefore, when destruction of the epithelium takes place the borders gradually drop and become confounded in an imperceptible slant with the loss of substance. The latter is occasionally covered by shreds of epithelium on the point of withering but at no spot is there anything which gives the impression of a retracted vesicle. On the contrary, the process has its seat in the mucosa which is swollen from a copious leucocytic infiltration. By a closer examination of the intimate structure of the nodule, it is found not to be merely an infiltration of polynuclear leucocytes, but that larger cells of another aspect participate in the formation of the nodule. While the peripheral zone is infiltrated by small polynuclear leucocytes in great quantity, the cells at the centre of the infiltration become gradually larger and closer together, their protoplasm is more strongly stained and their nuclei larger. They vary in number from one to several. Giant cells with peripheral nuclei, occasionally numerous and large, are also found. Leber attributes considerable importance to the giant cells around which he believes the nodule develops.

No foreign body or tubercle bacilli have been detected in these giant cells, neither has caseification been found in the rest of the tissues composing the lesion. The vessels present thickened endothelium with cells projecting into their lumen, which sometimes obstruct it completely and the discovery of giant cells in the vessel walls has led to the opinion that they are the result of an increase in size of the endothelial cells.

According to von Michel the phlyctena at one phase of its development forms a cavity filled with liquid and he describes three phases. In the first the epithelial cells in the affected area of the conjunctiva offer a normal aspect and among them are to be found numerous polynuclear leucocytes mixed with bits of nuclei. The epithelial cells are massed together at certain points while their structure is changed because they are compressed by superficial hemorrhage. He also noted a deepseated hemorrhage which formed a thick layer of blood. The component tissues were infiltrated with polynuclear leucocytes and the vessels dilated. In the second phase the upper layer of epithelium is traversed by leucocytes at many places, while between the superficial and deep epithelial layers the aspect of a vesicle can be made out. At this spot numerous epithelial cells are changed, sometimes degenerated, their nuclei staining less.

Polynuclear leucocytes are found in the centre as well as a mass of fine fasciculi, forming a broad layer at the lower epithelial stratum. The conjunctival tissue is greatly infiltrated with polynuclear leucocytes. All this is characteristic of vesicle formation.

In the third phase—that of definitive repair—there is an elimination of necrosed epithelial cells and at the bottom of the loss of substance fission cells are seen massed together. On the neoformed young connective tissue the epithelium regenerates and this is why at this point that the epithelium is separated from the connective tissue of the nodule by vesicles which are the débris of former hemorrhage. The lesion offers the aspect of a young cicatrix.

All observers excepting von Michel admit a nodular structure of the phlyctena and the majority reject the possibility of a vesicular phase. According to Wagenmann no necrosed tissue or fibrinous infiltration are to be found either in the cornea or conjunctiva. Sattler maintains that after rupture the phlyctena remains solid and is crater shaped. Wintersteiner never found the subconjunctival hemorrhage met with by von Michel, while Axenfeld, Wagenmann and Rosenhauck reject the tuberculous structure of the phlyctena in which no tubercle bacillus has ever been found.

The term phlyctena is a misnomer because the lesion is essentially composed of a subepithelial nodular mass of polynuclear leucocytes. By its structure and giant cells it approaches a tubercle but it differs from the latter in as much as tubercle bacilli have not been found, likewise caseification.

SMALLPOX

The smallpox menace is likely to be an increasing one in this country as it is in others where there has been a decrease in the percentage of those vaccinated against the disease. In some recent epidemics in this country the death rate showed an increasing malignity, and was a warning that the diagnosis of the disease and its prevention are becoming of the greatest importance.

It is interesting to see that in a country where health work has had a longer and larger share of public support than in this country there are districts as benighted and obtuse in such matters as our own. The experience of the city of Gloucester, England, is one which we may expect, however, to have repeated on this side of the water. This city of some fifty thousand people had recently 150 cases of disease which the city fathers and others interested in the city's trade rather than in her health interests, were intent on believing to be chicken pox. The local health officer, likewise, seems to have followed this lead. However, the Health Officer from Birmingham was called in, pronounced the disease smallpox and sent them to a hospital.

The city fathers became irate at such proceedings and were also incensed that the local newspapers should give publicity to the facts in the case. Gloucester was getting into bad repute and the only way out of it seemed to be to suppress the truth. At a meeting of the city council the qualifications of the Birmingham Health Official were questioned, whereupon that gentleman promptly left the meeting, telling them that they would have to get someone else to steer them through their plague and that he was leaving town. This action brought the council to its senses, and one of its members exclaimed, "Dr. Davidson has come here to save the city and we have treated him like a dog." A resolution of thanks and of confidence was then passed and presented to Dr. Davidson by a committee headed by the Mayor. The outcome of the Gloucester epidemic will probably be wholesale vaccination, for ninety per cent. of the population is said to be unvaccinated.

In this country we have had recently the picture of a department of education in a large city opposing the department of health in its efforts to check an epidemic of smallpox by vaccination, and this does not argue for a very rosy future for the subduing of such outbreaks. Possibly only severer epidemics can make us duly appreciative of the benefits of vaccination.

MILK ANAPHYLAXIS IN GASTRIC CASES

For a long time milk has been extolled as a food and especially for the purpose of providing a nutritious substance, freer than most other foods from irritating properties, in the treatment of gastric cases. Only a few years ago a doctor who threw doubt on the suitability of milk as the main if not the sole diet of persons suffering from gastric disorders would have been regarded with suspicion as to his mental state. Dr. F. J. Smith, late consulting physician to the London Hospital, was one of the first, if not the first, to change the routine practice of giving nothing but milk to those recovering from typhoid fever. He ordered meat and a mixed diet and obtained better results from this revolutionary treatment than physicians who continued to restrict the diet of their typhoid patients to milk.

Dr. Harry Campbell, also of London, has preached against the universal use of milk as a food in and out of season for years. He takes the stand that man is by heredity a carnivorous animal or, perhaps, rather a mixed feeder, that he is intended to eat hard food requiring mastication, and he argues that after childhood has passed milk is an unnatural food. Dr. Campbell states as his opinion that the early decay of teeth, the prevalence of digestive disorders and, indeed, many of the ills to which man is prone and suffers from are due to the consumption of soft pappy foods and too much sugar. Of course these views are not general, but, at the same time, they are gaining ground and, moreover, the time honored custom of feeding patients suffering from gastric diseases chiefly on milk is falling somewhat into disrepute.

At a meeting of the Medical Section of the Royal Academy of Medicine in Ireland, held in Dublin on January 5th last, the president, Dr. I. Gilman Moorhead, read a paper on milk anaphylaxis in which he protested against the almost universal and indiscriminate use of milk in cases of gastric disorder. While not denying the nutritive value of milk, and its soothing properties in many cases, such as gastric and duodenal ulcer, he voiced his conviction that, speaking generally, milk was not made for man, and that many gastric troubles were prolonged, and even made worse by the restriction of diet to milk and milk foods. It does seem a sound argument which Dr. Moorhead advances, or rather agrees with, that if an individual loathes milk, as certain persons do loathe it, it cannot be scientific practice to order it.

Sir John Moore agreed with Dr. Moorhead that milk sometimes was one of the worst things which could be given to patients. In cases of enteric fever he had often seen milk acting as a poison, and in such cases he had substituted whey and egg water. Dr. L. Abrahamson said that he had known a case of mucous colitis no better after being treated on a milk diet for about two years. The patient when put on meat juice made a complete recovery.

Dr. I. J. D. Lane said that the point in these cases was to find out if, when milk disagreed, it was due to anaphylaxis or not. If a patient gave an anaphylactic response to ordinary milk and not to boiled milk, he thought that was a point in favor of anaphylaxis. Several others took part in the discussion and all registered their opinion that milk was more or less frequently a harmful or an unsuitable food in gastric cases.

Is it the truth, then, that the value of milk both in health and in sickness had been exaggerated? To some extent, this statement may be true. Undoubtedly due consideration should be given to Dr. Harry Campbell's assertion that milk is not a food for adults, and that the conformation of our jaws and teeth show that we were intended to subsist on meat and food requiring mastication chiefly, with a sufficiency of vegetables and of food containing the vitamine elements in proper quantities. In fact, a diet of adequate metabolic equilibrium, in conformity with climate and manner of life.

With regard to milk in gastric cases it appears that with some frequency this fluid is not indicated, at least not as a sole diet, even when no distinct milk anaphylaxis exists. Lastly, it must always be borne in mind that, so far as milk as an article of diet is concerned, it is essential that it be free from contamination and that infection be wholly absent. Milk may be a dangerous food and the utmost care must be taken to render it safe. The question of its value in gastric cases is most interesting and the opinion of medical men on the subject would be of value.

THE ALMSHOUSE

It is a fact not generally recognized that over sixty per cent. of the inmates of almshouses are sick or infirm. The death rate in almshouses is very high and almost twenty per cent. of deaths are due to tuberculosis. The high death rate is not chargeable to the advanced age of the inmates, for over forty per cent. of those who die are under the age of sixty and twenty per cent. are under forty. Most of these patients suffer from chronic disease. It is selfevident that the provisions for the care of chronic patients must be inadequate in the innumerable small county almshouses scattered throughout the country. Not without reason has it been said that "the county almshouse is a hospital with the hospital part left out."

On the face of it, it is impossible to expect small county almshouses, with limited budgets, to furnish adequate facilities for the care of their inmates. The only opportunity for improvement will come from a development analogous to the movement which removed the insane from the almshouses and assembled them in large state hospitals. Such state hospitals will have to be planned for the specialized purpose of giving proper medical, nursing and custodial care to their inmates. A careful study of this problem is urgently indicated. (Present Institutional Facilities for Care of Chronic Diseases, Ernest P. Boas, *The Modern Hospital,* July, 1923.)

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News Items.

First Harvey Lecture.—Dr. A. Biedl, Professor of experimental pathology at the University of Prag, delivered the first Harvey Society Lecture at the New York Academy of Medicine on Saturday evening, October 13, 1923. His subject was Organotherapy.

To Open Gallstone Clinic.—A free clinic for gallstone sufferers will be held daily from 10 a. m. to noon at the Good Samaritan Dispensary, Essex and Broome Streets, by Dr. Ulvi Goldenberg, Vienna specialist, who recently arrived in this country. Dr. E. W. Lipschutz, of Brooklyn, will assist Dr. Goldenberg.

Insulin Given by Rockefeller.—Provost Josiah H. Penniman, of the University of Pennsylvania, announces that John D. Rockefeller, Jr., has given to the university $10,000 to be used in treating with insulin a large number of ward and dispensary patients suffering from diabetes, and to teach physicians in general practice the proper method of employing insulin in the treatment of diabetes.

Physicians and Red Cross.—The medical profession in New York City is cooperating with the Red Cross in its annual Roll Call, which opens Armistice Day, November 11th and continues until Thanksgiving, for the enlistment of new members to maintain the organization's peace time program of relief and public health work. Dr. Frederick Tilney, of New York, is chairman of a special physicians' and surgeons' committee, formed in accordance with the campaign plan of organizing the entire city into various groups to facilitate the Roll Call effort.

Dr. Lorenz Returns.—Dr. Adolph Lorenz, Viennese bloodless surgeon, accompanied by his son, Dr. Albert Lorenz, are back in America. Dr. Lorenz will go to Buffalo, N. Y., at the invitation of the Mayor, and there conduct a clinic. Later he will return to New York and be associated with Dr. Yeager at 471 Park Avenue.

Memorial for Dr. Pryor.—On October 10, 1923, the Buffalo Academy of Medicine will hold a memorial service in honor of John H. Pryor, M. D., F. A. C. P., one of the founders of the academy. The services will be held at 8:45 p. m. before the section meeting in the Fillmore Room of the Hotel Statler. This memorial service is held in cooperation with the Medical Society of the County of Erie and the Physicians' Protective Association.

The Centenary of the *Lancet*.—A dinner is to be given in celebration of the hundredth anniversary of the *Lancet* which will be held in London on November 28, 1923. Sir Donald MacAlister, president of the General Medical Council of Great Britain, will be in the chair, and he will be supported by the president of the Royal Society, the president of the Royal College of Physicians of London, the president of the Royal College of Surgeons of England, the Minister of Health, chief medical officer, president of the Royal Society of Medicine, and the president of the Medical Society of London.

Four Free Clinics to Be Open.—Four free clinics where medical, neurological, psychiatric and psychological examinations and treatment according to the best modern scientific principles will be given by specialists, will be opened by the Jewish Board of Guardians, supported by the Federation for the Support of Jewish Philanthropic Societies. The clinics will be available to all men and women under the board's supervision. The psychiatric clinic will be under the direction of Dr. Dudley Schoenfeld of Mount Sinai Hospital; psychopathic and glandular treatment will be given by Dr. Spencer Strauss of the Postgraduate Hospital; Dr. N. Thomas Sax, pediatrician of the Postgraduate, will be in charge of the medical clinic, and Dr. Max Schultz, of the same hospital, will head the neurological clinic.

Interchange of Health Officers in the United States.—An event of deep interest for world health is the third general interchange of health officers arranged by the health section of the League of Nations which is now taking place in the United States. Representatives from France, England, Italy, Russia, Poland, Spain, Holland, Belgium, Greece, Jugoslavia, Germany, Switzerland, Norway, Mexico, San Salvador, Brazil, Chile, and Canada, delegated by their respective governments to participate in a course of study and observation, arrived in America the first week in September and will remain for approximately three months. Until September 22d the delegates will remain in Washington, studying national health organization as administered by the United States Public Health Service. Following the close of the course of study of the national health agency the delegation will separate into three groups in order to study state and local health departments.

Foreign Correspondence.

SOUTH AMERICAN LETTER

(*From our own correspondent.*)

BUENOS AYRES, ARGENTINE, *August 1, 1923.*

CRUISE OF AMERICAN COLLEGE OF SURGEONS.

The recent cruise of the American College of Surgeons, organized for the purpose of increasing our knowledge of South America and stimulating friendly relations with the people, and more particularly the surgical profession of these republics, was a great success. It was an opportunity never before offered to such a large body of medical men. They were everywhere received with the most open handed hospitality; receptions being arranged for them where we met the presidents of the republics visited. The American ambassadors did everything in their power to make our visit pleasant. To get the proper perspective we must bear in mind the struggles through which these republics have gone and how very recently stable governments have been established in many of them.

CUBA.

Cuba, the last to have thrown off the Spanish yoke, shows the influence of the brief American occupation and its close proximity to the United States in the manner in which their hospitals conform to American standards, particularly in good screening, ventilation, and training schools for nurses.

PANAMA.

In Panama, while most of the time was spent in the canal zone, which is strictly under American control, we could still readily see that the Panamanians were not slow in adopting the lessons in sanitation which were responsible for converting this pest hole into a veritable tropical health resort. While there the surgeons had the pleasure of being present at the laying of the cornerstone for the Gorgas memorial institute of research in tropical disease and preventive medicine.

If, as the result of the work of this institution and others such as the Oswaldo Cruz Institute in Rio Janeiro, our knowledge of tropical disease increases as much in the next twenty-five years as it has in the past, and our preventive measures keep pace, it will mean that this vast area will be opened to occupation by the white people of these countries and their wonderful natural resources be furnished to the markets of the world. The schools and hospitals are supported and controlled by the state. Some of the hospitals have hospital boards.

MEDICAL SCHOOLS VISITED.

The medical schools were found to be most complete in the way of buildings, laboratories, etc. A seven year course is required for graduation, and one wonders why the men turned out are not superior to ours. On closer study we find there are over fifty holidays exclusive of Sundays each year so that the actual hours required is not greater than with us and added to this a tropical climate which is not conducive to full speed probably tells the story at least in part. The private patients are taken care of in sanatoriums owned by the various doctors. Some of these were as fully equipped as anywhere in the world, and most excellent work being done.

Their public hospitals were, as a rule, large, clean, and well ventilated, but lacked screening and proper nursing staffs. The operating rooms were large, not screened, and poorly ventilated, which defects are being slowly overcome. The nursing problem is a hard one, the better class girls being taught to look upon nursing as menial, and until by education this attitude is changed the outlook is poor.

The surgery seen in the public hospitals while in the main good was not all of the first order; in certain cases the vital principles being sacrificed to speed.

ARGENTINE.

The disease which excited the most interest, perhaps on account of its frequency, especially in Argentine and its rarity with us, was echinococcus disease of the various organs of the body. It was not at all unusual to see from one to five of these cases being operated on in a single clinic in one day.

The procedure was usually under a general anesthetic to expose the cyst, and after due precautions being taken to prevent contamination of the surrounding tissue, to aspirate through a large trochar as much of the contents as possible, then to clean out the remaining daughter cysts and drain, if complete dissection was impossible. Many of them remained cured but I saw patients being operated on for the third time. Most of the surgeons showed the effects of foreign training, particularly French, and many of the instruments used were of French manufacture.

GENEVA LETTER

(*From our own correspondent*)

GENEVA, SEPTEMBER *20, 1923.*

CONGRESS OF MEDICINE AT HELSINGFORS.

At the recent congress of medicine held at Helsingfors, E. H. Jagerskiöld discussed a topic of considerable interest, namely, the capillaries in pernicious anemia and other affections of the blood based on the results obtained by capillaroscopy. Examinations of the capillary loops at the root of the nails with a power of fifty diameters, in cases of pernicious anemia, were found very pale, indistinct, filiform and irregularly distributed under the skin. The venous segment was abnormal and larger than the artery while the short connecting segment—often assuming a figure eight in shape—was of small calibre. Usually the blood current was rapid and homogeneous in the smallest capillaries and interrupted in the larger ones. Normal peristaltic contractions were not observed and compression of the vessels of the arm failed to produce them. But when the compression was released, just enough to allow the arterial flux to pass, a segment of the capillary vessels became gorged with dark colored blood and other loops which had not been in evidence appeared in the field presenting the same conditions.

In cases of pronounced anemia—with about 1,000,000 red cells—the capillaries were indistinct, very pale with a greatly accelerated blood current. In cases of medium intensity the capillary loops were better filled and higher in color.

In mild anemias, the aspect of the loops did not vary much from the normal but it is interesting to note that a clinical amelioration of the patients was often accompanied by a change of aspect of the capillaries and although such changes were not constant, this resulted from other factors present.

In simple anemias similar pictures are seen but in chlorosis nothing of the kind takes place, the loops only being somewhat pale. In Vaquez's disease, the capillaries abound, gorged with reddish brown blood and occasionally three to seven times larger than normal. Peristaltic movements were active and the blood current irregular.

All things considered, it may be assumed that the state of capillary plenitude depends upon the amount of the mass of blood and this is why it is mild in anemias and high in chlorosis and polyglobulia. At any rate this procedure of exploration should be of great interest for following parallelly the blood count during the clinical evolution of high grade anemias.

ANDRÉ THOMAS, OF PARIS, ON VASCULAR SPASM.

Since we are discussing the vascular system, I would like to refer to the recent work done by Dr. André Thomas, of Paris, on the question of vascular spasm in intermittent claudication as opinions greatly differ in respect to this phenomenon. From very exact and complete experiments carried out in two cases in order to elucidate the provocative cause of the spasm, this observer has been able to show that, generally speaking, many local and distant factors may be quite sufficient in these patients on account of the arteritis present as well as a special sensibility and spasmophilia. Light massage, passive movements of the toes or metatarsus, pressure exercised over the inalleolae may provoke paleness of the skin and then cramplike pain which prevents walking. Pressure over the iliac crest or horripilation over an extensive area of the body may also be followed by a vascular constrictive crisis.

It would therefore seem that when the act of walking causes the spasm, a number of causal factors come into play and not a single one, so that the mechanism of the spasm is a complex one. But a most interesting point to which I would call attention is that with the oscillometer one can detect the early commencement of these same vascular changes in perfectly healthy subjects when submitted to provocative tests and active or passive movements of the lower limbs. Therefore, it is probable that the disturbances of intermittent claudication are merely exaggerations of a rupture of the equilibrium between the arterial and venous systems ordinarily occurring during the act of walking.

PIERRE GIRAND ON STERILIZATION.

A very good thesis (Paris, 1923) has just been issued from the service of Prof. Couvelaire, by Dr. Pierre Girand on the sterilization of hereditary syphilitic infants. Girand takes pains to show the necessity of searching for syphilis in the parents at the onset of every pregnancy, especially if the gestation is abnormal. If parental syphilis has been detected, the mother should, of course, be treated during pregnancy and the infant should be treated after birth for not less than eighteen months. The Wassermann reaction is frequently negative although clinical manifestations of syphilis are present. Continue treatment after a positive Wassermann has become negative. Then, after a prolonged rest from treatment reactivate, in order to test the blood serum and cerebrospinal fluid.

On account of ineffective treatment of poisoning by mushrooms, Dr. Dujarrie de la Riviére has recently undertaken to prepare a serum which, it would seem, has been successful, if one may judge from his report to the Academy of Medicine of Paris. By using a toxin extracted from a mushroom of the gender *aminata,* this observer immunized horses by progressively increasing doses—a procedure necessitating very great precautions—after which he studied the action of the serum in rabbits and mice.

The serum has an unquestionable prophylactic value, a fact made evident by first subcutaneously injecting the serum, after which the toxin is injected into the peritoneum. By simultaneously injecting the serum into the marginal vein of one ear in a rabbit and the toxin into the other ear, the animal remains well. When the serum is injected subcutaneously or intraperitoneally during the first two hours following an injection of the poison, the serum neutralizes four lethal doses of the toxin. A mixture of serum and toxin allowed to stand for one hour and then injected into the peritoneal cavity of an animal was found to remain neutral.

LONDON LETTER.

London, *July 25, 1923.*

DINNER OF THE BRITISH FEDERATION OF MEDICAL AND ALLIED SERVICES AND THE NEW CANCER MOVEMENT.

The Federation of Medical and Allied Services, although a comparatively recent institution, if it may be termed an institution, has taken root and is flourishing apace. This is convincing evidence that it supplied a want and is working along the right lines. It is usually the custom in this country to celebrate an anniversary or anything of that sort by a dinner and, of course, the federation upholds this good old English habit. Its annual dinner was held at the Langham Hotel, London, on May 29th last, Sir Berkeley Moynihan, the president of the federation, being in the chair, and the Minister of Health, the Rt. Hon. Neville Chamberlain, the principal guest.

The chairman, in proposing the health of the Minister, said, in part, that the community was at last beginning to take an interest in public health and that was all to the advantage of the federation. If cancer was only to be cured by early research it was essential that the public should be educated to discover and report themselves very early in regard to those departures from health which cancer declared. It may be here interpolated that the federation has had a great deal to do with the organization of the new campaign against cancer which has been inaugurated in Great Britain and which is being conducted as vigorously as circumstances permit. In fact, the federation is attempting earnestly to make an alliance between medicine and the public. Trying to educate the community to the advantages of preventive medicine, nursing, pharmacy, industrial hygiene, and so on, and in the principles of preventive medicine in the broadest sense of that word, the federation is acting or endeavoring to act as a "go between" with regard to medicine and the public, in so far as instructing them in the precepts and practice of modern medicine are concerned.

Sir Berkeley Moynihan pointed out that public health could no longer be studied unless the public played their part. One of the lessons learned during the war was that no campaign could be planned or launched unless regard was paid to the casualty lists, for the strength and striking power of the army depended upon the health of the troops. It was the same in industry as in war, and captains of industry were beginning to realize that if they were to carry on their work with the largest profit they must regard the welfare of the men working under them. In this connection the federation is playing an important part. Its annual report showed that industry after industry was beginning to realize that the federation was giving them substantial help in this matter, but if the work was to extend and grow it was necessary that further financial support should be forthcoming. The great resources of the federation in technical knowledge were at the disposal of the Ministry of Health and the federation would be proud to be made the medium of help in every possible way.

The Minister of Health, in responding, said among other things that he was glad to hear Sir Berkeley Moynihan refer to the cooperation with industry, because he felt convinced that that was a valuable sphere of operation. Regarding the many diseases that prevailed, the causes of which were obscure, it seemed to him that there was nothing they could more fruitfully devote their attention to than the furthering of research. But more opportunities and more inducements must be provided for men to engage in research. Doctors could not do that and at the same time carry on a general practice in order to live. It could not be doubted that the efforts made in recent years to grapple with scarlet fever, measles, cancer, and other dangerous enemies of mankind had borne good fruit, for in the years that followed the war, despite all its consequences in suffering and depression, the vital statistics of the country were never so favorable. He supposed that some day they would have a complete health policy for the country, and it would have to come about under a minister who was fortunate enough to remain in office for more than a few months at a time. He did not pretend to say what that policy would be, but he thought we could even now see where our weak spots lay. The institutional accommodation was inadequate. We have physicians and surgeons second to none, and we do not make the best use of their services, nor of the nurses. To attain an efficient health policy all the resources at our disposal had to be used, and it was because the federation could help in that matter that he wished it all prosperity and success.

As pointed out, the province or the self-appointed task of the federation appears to be to educate the public with regard to medical matters in order that lay members of the community may be induced to take an intelligent concern in health affairs. Matters concerning which people are ignorant are generally regarded with indifference or with distrust and there are many phases of preventive medicine of which the masses are grossly ignorant. It is one of the main objects, then, of the federation to inform them on obscure points and to try to make clear to them that medical research, for example, is for the benefit of the people at large, although few of the results may be immediately evident if at all. Cancer is a subject regarding which the public is profoundly ignorant, nor, it may be said, are medical men themselves well informed. But the public is commencing to recognize the fact that malignant disease is taking an increasingly heavy toll of the population and if they become convinced that if certain measures were introduced the disease could be prevented to some extent, they would adopt such measures. Medical men do know, and know little more, that the only chance of diminishing the mortality and suffering from cancer is early diagnosis and early effective treatment. Doctors also know that while, up to the present time, research and investigation have yielded no definite results, in some directions, the outcome has been encouraging and that it is well worth while to continue efforts of every kind to unveil the mystery of cancer.

In Great Britain an organized campaign against cancer is about to be carried on zealously. An important communication has been published in the lay press throughout the country over the signature of these well known men, Sir Napier Burnett, head of the Hospital Service of the British Red Cross Society; Lord Dawson of Penn, an eminent London physician; Lieutenant Colonel F. E. Freemantle, an army medical officer and a medical officer of health; Dr. John B. Farmer, professor of botany and director of the biological laboratories at the Imperial College of Science and Technology; Sir R. C. Garton, director of Lloyds Bank; Colonel Sir C. Gordon Watson, surgeon at St. Bartholomew's Hospital; Dr. R. A. Gibbons, Sir Thomas Horder, Lieutenant Colonel Knox, of the Indian Medical Service; Mr. G. Locker-Lampson, M.P.; Mr. J. Lockhart Mummery, senior surgeon at St. Mark's Hospital for Cancer; Sir E. Marshall-Hall, K.C., a celebrated advocate; Mr. J. Beaumont Pease, deputy chairman of Lloyds Bank; Sir Bernard Spilsbury, late honorary pathologist at the British Home Office; the Hon. Sir Arthur Stanley, chairman of the Joint Council for the British Red Cross and the Order of St. John, Sir William Willcox, scientific analyst and medical advisor to the British Home Office.

VIENNA LETTER

(*From our own correspondent*)

July 5, 1923.

MEDICOSOCIAL LECTURES.

The syndicate of forensic reporters of the Vienna journals has requested Dr. Julius Tandler, the world wide known anatomist of the Vienna University, the social democratic sanitary advisor of the City of

Vienna, to hold a scientific lecture on some medicosocial topic. Professor Tandler complied with the request with pleasure, and held his lecture on February 19th in the spacious hall of the Vienna Concert House, which was crowded by an audience consisting of hundreds of physicians and the most distinguished lay public of the capital. Professor Tandler is extremely popular in Vienna, all hygienic reforms of the republican Vienna are connected with his name. For instance, the erection of the so much discussed crematorium, the marriage advising bureau (*Ehebcratungsstelle*) and the advisory bureau for sexual patients (*Bcratungsstelle für Geschlechtskranken*) are all his creations. He wrote a memorandum during the war, on the hygienic conditions of Austria. Emperor Charles consulted him on sanitation matters in the field, and the newspapers remarked, when reporting this interview, that Professor Tandler was audacious enough to give his socialistic opinion about the conditions caused by the war also to the late Emperor. During the war he was invited several times by the Social Science Association in Budapest to hold such lectures. After the revolution he became State Secretary for Public Hygiene, but he could not remain long in this position because he longed after his university chair and after one and a half years keen work as State Secretary he abdicated from this position and returned to the university to teach anatomy again.

CHILD HEALTH.

The health of children, he said, was never the point of view of populating policy. It was always money that played the chief rôle, and never the welfare of the new generation. Even wives had a subordinate rôle in the interest of defending property, she herself being in principle the property of the husband. With all ancient cultured nations the wife has been the slave of her husband, and the law of wife has been obedience. Nowhere do we see between husmand and wife the relation of uniformity of rights. The revolution of 1789 approached the emancipation of women, in a certain measure, but this was still very far from that which could satisfy the requirements. After the revolution a capitalist world philosophy followed, and in this world order we find women divided into three classes, industrially: 1. The life of the richest women, who have absolutely no necessity to work, even the education of their children and their housekeeping are done by paid women. 2. Women of the middle class, who, in most cases, have to work within their own homes. 3. The working women, who have to work for wages. The marriages of the last type of women are generally said to be unhappy, the unhappiness being due only to economical conditions.

The basis of the populating policy is the valuation of men. The higher the degree of the culture of community, the greater value is given to men. The war has thrown European culture back to the times when human life was very cheap and all became accustomed to the thought of violent death. The populating policy regards as its organic capital the family. This capital can be increased both as to quality and to quantity. The quantitative augmentation is an ancient principle. The Jehovah of the *Old Testament* promised as a reward that they would increase in number as the sand of the sea. We should not forget the quantitative augmentation was an imperialistic policy. It does not mean anything else than the strengthening of the armies, and the fortifying of those in power. The great number of births mean more soldiers. And the other directing principle of this policy is a mercantilist one: to create sufficient hands for the machines. The greatest sin of this policy is that it does not wait until the maturity of adults, but it blemishes the picture of society with puerile working power.

BIRTH RATE.

The true socialistic populating policy acknowledges in the first line the right of every man towards the values of life. By this reason the increasing of the birth is not more important for this policy than the decreasing of mortality. We see that in France births are encouraged by premiums given by the State, but no premium is given for decreasing mortality. The French people are accused by its own Government of being sexually perverse, arguing that this is the cause of the low birth rate. But this is a false statement. Sexual perversity is not responsible for the low birth rate, but poverty, and economical misery. If we compare the mortality rate of the civilian and working classes, we see that in the former on an average eighty-two per cent. are reaching the sixteenth year of life, while in the working class scarcely fifty. Births are not to be encouraged, but the preservation of lives by conditions of living worthy of men. Another wise institution would be the compulsory maternity enacted in a law. At present the obligation to become a mother does not refer to the rich people. These, by reason of their female culture, get the necessary enlightenment, which enables them to evade the possibility of fecundation. The women of the poorer classes, however, have to take recourse to the most dangerous procedures for want of enlightenment and money. The time is ripe that in case of artificial abortions dealt with before the courts not only the developing childlife, but also the interest of the woman should be represented by the State experts.

Poverty decimates people, but the modern medical sciences are likely to govern mortality with great success. The illegitimate children are those who mostly succumb in the difficult economic conditions. The modern social politics does not know girl mother and illegitimate child. Only mother and child. The foundling houses are the remainders of out of date institutions. We are endeavoring in Vienna that a mother shall be able to educate her child born out of wedlock at least as well as a legitimate child. We condemn the erroneous policy of our State, said Professor Tandler, spending eighty milliards for old age pension and forty-four milliards for the treatment of the insane; in consequence of these vast figures the State Treasury is unable to spend more than 67.5 milliards for children protection, although if the larger sum would be spent for the protection of children later on we had not to keep so many incapacitated men.

It is our chief duty toward the children that the parents shall be healthy. We have to awaken in men a feeling of responsibility toward the coming children which will save the new generation.

Book Reviews

THE HEART

Ieart Records. Their Interpretation and Preparation. By S. Calvin Smith, M.S., M.D., Philadelphia. F. A. Davis Co., 1923.

This volume is intended by the author as an elenentary guide for those who would familiarize themelves with electrocardiographic and polygraphic nethods. The book is eminently practical and avoids ll speculations and hypotheses. After a brief disussion of the physiologic basis of electrocardiogaphy, Dr. Smith discusses the normal electrocarliagram and the interpretation of abnormal records. ll controversial points have been avoided. The ollowing chapters deal in considerable detail with he technic of electrocardiographic methods. The eginner will find many valuable practical hints vhich, if carefully observed, will help him avoid umerous pitfalls and annoyances. The final chaper is devoted to a brief discussion of polygraphic nethods and tracings. There are 126 original illusrations, well chosen and reproduced. It is refreshng to find in a book devoted to electrocardiography he statement that "Heart records can only supplenent—they can never supplant the painstaking linical examinations." In this volume Dr. Smith as achieved his purpose of giving a simple but adeuate and accurate presentation of the elements of lectrocardiography and polygraphy which will be f real service to the medical student and to the beinner who would familiarize himself with these raphic methods and their interpretation.

SKIN AND VENEREAL DISEASES

ehrbuch der Haut-und Geschlechtsleiden (Einschliesslich der Kosmetik). By Sanitätsrat Dr. S. Jessner, Königsberg. Sixth and Seventh Revised and Improved Editions. Leipzig: Verlag von Curt Kabitzsch, 1923.

The first volume, Skin and Cosmetics, and Formuıry, covers the subject of dermatology and cosetics, in a clear, easily understood fashion, that akes a strong appeal to the student or the practioner who desires a working knowledge of skin iseases. This is not a volume for the specialist ut for the general practitioner and student. In ypography and arrangement it is all that could be esired. The colored plates are true to life and finely ortrayed. Special chapters deal with dermatoscopy, ermatotherapeutic remedies and the internal treatent of skin lesions. The latter includes the subects of internal chemotherapy, vaccine and serum erapy and organotherapy.

The second volume deals solely with the three enereal diseases, gonorrhea, syphilis, and chancroid. hese subjects are treated in the usual way, parcular emphasis being laid on pathology and treatent. Salvarsan and its derivatives occupy the vored position in the treatment of syphilis, though fairly large number of arsenical and mercurial reparations of German origin are favorably menoned as altenatives. The relation of marriage to philis is seriously considered at length, from a beral point of view, conforming in general with the ost recent opinions on this question.

Permanganate irrigations and the silver salts are favored in gonorrhea, but there is a noticeable omission of endoscopic and operative measures in the therapy of chronic gonococcal infections characteristic of medical opinion in the United States.

On the whole it may be said these volumes represent the prevailing confidential methods of diagnosis and treatment, and constitute a safe guide for the practitioner and student, though the second volume could be improved by the inclusion of some of the recent work on the seminal vesicles done by American venereologists and urologists.

SURGICAL DIAGNOSIS

Chirurgische Diagnostik (in Tabellenform für Studierende und Arzte). By Dr. Med. A. J. Cemach, Vienna. Third and Fourth Improved Editions. Munich: J. F. Lehmanns Verlag, 1923.

This edition is an improvement upon the second (1921) edition by changes in the text and tables, and by the addition of a number of new röntgenographs and plates, bringing the work up to date in every detail.

The author has produced a volume of extreme utility and beauty. There are very few pages of text matter and the tables are conveniently arranged, showing at a glance the differential diagnosis and the actual diagnosis of the subjects described. The result of this unusual arrangement is a volume of comparatively small size, covering practically every conceivable surgical condition that might be of interest to the student and the surgeon. The illustrations in black and white and the colored plates are placed in juxtaposition to the tables as closely as practicable, thus visualizing the subject in the most practical manner. The plates and illustrations are true to nature and exceedingly beautiful from the artistic point of view—an important feature in any book dealing with surgery.

This attractive work surely must retain the popularity which has characterized its predecessors, for which there was a demand for three editions within the short space of two years. It is a volume that any one interested in surgery can study at the same time with profit and pleasure.

MEDICINE

A Synopsis of Medicine. By Henry Letheby Tidy, M.A., M.D., B.Ch. (Oxon.) F.R.C.P. (Lond.). Third Edition, Revised and Enlarged. New York: William Wood & Co., 1923.

In the arrangement of this rather pretentious work the author has followed that of Osler's "Principles and Practice of Medicine" with few exceptions. This volume is not intended to be a textbook, but a synopsis, having for its object to assist those who find it necessary to cover the ground in a short space of time. We believe the author has succeeded in producing a volume that cannot fail to be of great assistance to the medical student or the busy general practitioner involved in a doubtful diagnosis or therapeutic problem, with little time or inclination to wade through cumbersome textbooks.

The present revised edition contains much new matter, new articles having been added on veronal and cocaine poisoning, Vincent's angina, cyclical vomiting, coeliac disease and sprue; also on the tests of renal efficiency. Yellow fever has been removed from the section on Diseases of Unknown Etiology and transferred to that on the Spirochetal Diseases, due to the researches of Noguchi.

The volume is carefully written, compact and truly a valuable synopsis of present medical knowledge; but, as the author well says, it can never take the place of the textbook. As a matter of fact, he does not desire that it should.

UROLOGY

The Urethra and the Urethroscope—A Manual of Practical Urethroscopy. By F. Carminow Doble, M.R.C.S., L.R.C.P. (Lond.), with Foreword by Major A. T. Frost, O.B.E., R.A.M.C. London: Henry Frowde and Hodder & Stoughton, 1923

Recognizing the fact that works on venereal diseases, even the largest, allot but little space to the subject of urethroscopy, the author very commendably has produced an attractive and useful volume dealing with the urethra and its examination in health and disease by means of the urethroscope. Unfortunately for American readers, the instruments employed and described in the book are entirely European, the American instruments not receiving sufficient recognition even to be mentioned by name. Notwithstanding this shortcoming from the American point of view, the work is one of decided merit, though rather elementary in some respects.

There is an excellent chapter on urethroscopy and its technic in the female. The printing and paper are of unusually fine quality.

PSYCHOANALYSIS

Some Applications of Psychoanalysis. By Dr. Oskar Pfister, Pastor in Zurich, Switzerland. Authorized English Version. New York: Dood, Mead and Company; London: George Allen and Unwin, Ltd., 1923. Pp. 352.

Pfister's enthusiastic loyalty to psychoanalysis and that as it is given by Freud makes of this book an ardent plea for psychoanalysis both as theory and as practice. His own breadth of culture with his special training in the psychological field and in philosophy give his writing a rich background. It makes him competent to compare as he does in one very interesting chapter the systems or part systems which various men have deduced from Freud's original theory. He presents as in all his writings stimulating reports from his own successful work with psychoanalysis. Yet his thought is governed rather overwhelmingly by the idealism toward which he would have psychoanalysis tend in its results. His wish, exalted and stimulating as it is, too greatly dominates his thought. His own philosophy of psychoanalysis is not put forward with that fundamental clearness which he himself extols in Freud's stricter empiricism. He is not finally convincing in all that he says—is some of it perhaps the fault of the translation of expression none too clear in the original tongue? Or is it due to Pfister's religious idealism which crowds him in an over anxiety to reinterpret all the findings of psychoanalysis to the service of his own great ideal? Perhaps, for example, psychoanalysis can render, as he believes, definite service upon the mission field. It surely should aid to valuable psychological revelations. But Pfister's high claims for Christianity as over against other religions strengthen one in the feeling that his empirical acumen of vision is somewhat clouded by the enthusiasm of his own projected vision.

PSYCHOLOGY

Medical Psychology and Psychical Research. By T. W. Mitchell, M.D. New York: E. P. Dutton and Company, 1923. Pp. vii, 244.

Mitchell submits to examination certain phenomena observed in medical psychology which he considers part of the legitimate material for psychical research. These are the phenomena of hysteria, manifestations of multiple personality and in hypnotism the striking appreciation of time evidenced chiefly in those totally amnesic to the hypnotic trance, technically in "somnambules." Careful observation which takes account of all facts but with strict regard to their authenticity marks the presentation of the author's material, both his own and that gathered from other observers. His is one of those larger minds which can afford to wait before interpretations are made or conclusions drawn. There is deep appreciation of the affective possibilities behind the dissociations of consciousness which appear, a recognition of the subject's own participation in bringing about his condition, be it hypnosis, obedience to suggestion or the splitting of the personality which is glaringly manifest. The writer is inclined therefore to interpretation without the introduction of any supranormal factor but even here he refrains from prematurely conclusive dogma. He has not entered into the revelation of the individual affective content which might underlie the material set forth but he has not left this affective material without reference to its existence and significance. He especially acknowledges the guidance of Janet and Freud, the former as giving the most aid from the merely descriptive standpoint, the latter as performing much more fruitful service from the standpoint of interpretation. Mitchell's own thought is profound as he follows inquiringly the phenomena which he reports.

MAYO PAPERS

Papers from the Mayo Foundation and the Medical Schoo of the University of Minnesota, Volume II, 1921-1922 Philadelphia and London: W. B. Saunders Company, 1923

Nearly all of these papers, more than a hundred in number, by ninety-two authors, were presented originally as theses by graduate medical students of the University of Minnesota in partial fulfillment of the requirements for the degree of Master of Science or Doctor of Philosophy. There are also a few papers other than these graduate student theses, and a few on various phases of medical education by members of the graduate faculty.

The first volume of similar papers which appeared last year was so favorably received that the publication committee felt justified in offering this second volume. A glance at the table of contents will convince the reader that the subjects enumerated cove an unusually wide and interesting field, and the perusal of the articles themselves, clearly written and freely illustrated, will more than justify this conviction.

There is an extremely interesting paper on The Laws of Heredity and Their Application to Variou

Conditions in Man, by J. Arthur Buchanan, in which migraine, essential epilepsy, inheritance of the blood group, diabetes mellitus, essential asthma and protein sensitivity are studied from the standpoint of heredity. The author reaches the almost revolutionary conclusion that "the data presented are criteria against the continuation of the use of the expression 'inheritance of susceptibility to disease.'" He concludes that no evidence has been presented in the study of heredity to show that characters are susceptible of appearing or that there is a tendency for them to appear. They are either present or absent. There is no uncertainty.

PHYSICAL THERAPY

Therapeutics of Activity. By ANDREW A. GOUR, M.G., D.O. Chicago: Covici-McGee, 1923.

In the introduction to this volume, the writer claims "this book rightly understood will settle the question of specific activities for everyone." The author evidently has attempted to include in a book of some 400 pages the entire scope of exercises from the ordinary home gymnastics to sports, games and medical gymnastics. In the beginning the author attempts a defense of the Ling system as if the value of the Ling system, properly carried out, were not appreciated. Throughout the book the value of medical gymnastics is brought out, the author repeatedly adding that for the full effect, necessary osteopathic adjustments should also be performed. Everything from rhinitis, tonsillitis, pleurisy, tuberculosis of the lungs to prolapsus of the rectum is given more or less the same outline of treatment. Flat foot, according to the author, is cured through adjustment of the innominate or superficial lesions below the eleventh dorsal vertebræ, but the exercises mentioned cure only fifty per cent. of the cases without spinal adjustment. In inflamed hernias, which according to the author are due to injury of an irreducible hernia, he advises every possible means to empty the bowels, including castor oil and salts. Surgery is mentioned to prevent strangulations.

Throughout the book innumerable faulty physical principles and pathological processes are emphasized. The book is poorly written, filled with cheap photographs, and aside from the statement of the already accepted Ling basic principles, contains little that would be elucidative to the medical man and less that could be made of value to the layman.

THREE STORIES BY LAWRENCE

The Captain's Doll. Three Novelettes by D. H. LAWRENCE. New York: Thomas Seltzer, 1923.

Lawrence has come into his own again with the publication of this last volume of short stories. Together with *Sons and Lovers* we feel this marks the height of his achievement. The other volumes show him always alert, making the most of the curious finds he draws from the dunghill of common lives. Perhaps our taste is too puritan. But in our opinion being true to life has its best and most tasteful expression in only these two of Lawrence's fiction works.

When he expatiates on psychoanalysis we are sorry for him. He is almost ludicrous. But when his characters live themselves with all their psychopathological vagaries we welcome his pages as a remarkable guide to the technic of the very subject he does not seem to be able to express as such. In these three novelettes he gets back to his own and fundamental themes—the mother fixation—which he resolves in three different ways.

We have the drawing together of opposites, complements, in the sphere dubbed abnormal, but now found to be so nearly universal that we are forced to shift to "bisexual" as a better designation. There is in everyone the possibility of developing one or the other side of his nature according to the fate he meets. The Captain, reborn in a child-craving lover's skill as a doll, is seeking the eternal mother. The older woman he has married, her premature aging in body and mind, and her final complete identification with his mother that costs her her life, are but stages in the sex history of many patients. The Captain then has to replace this mother. He seeks the creator of himself (the doll) and finds the Countess Hannele on the verge of marrying a father substitute. She has battled for her personality until she is tired. She now wants to be protected but not "bothered." So the Captain with his offer of a life of hero worship and motherly prostration for her fulfills both their needs.

The Fox takes up the mating of two homosexuals. March, the woman, has played the male role in her farm household with the frail, neurotic woman friend. The red fox, the dreamed-of fox brush across her face, are calls from the unconscious of her dormant womanhood. Then when the youth who is mentally identified with the fox comes upon the scene there is uproar. He not only kills the fox and kills the friend, but effectually lays the ghost of March's nascent femininity. All her fixation objects converge in him. They marry, and then wonder why she is depressed! They count upon the new beginning in the new country to shake her out of herself. Perhaps it will. Any call upon her self-reliance would probably be effective. For she is psychically of the aggressive type and her mating with another aggressive bodes constant conflict for both of them.

The last story, *The Ladybird,* is the most curiously wrought. It is a beautiful texture of human unconscious motives, as changing and as subtly interwoven as a piece of music. The story is difficult to describe. The Bohemian count, undersized, exotic, son of outlaws, appeals to the Junoesque, conventionally bred daughter of an English wildling. Her mother is perfection, so the father is made to conform, the daughter is married to the suitable man. The war flings everything into a common mill, and brings Count Psanek, wounded and a prisoner to England and reckons the husband among the missing. The wounded man recovers; the husband is found. In the course of a triangular houseparty after the war, Lady Daphne becomes the day-time wife of her husband who confesses to much deeper regard for her as a sister being than as a sex mate, and the night wife of the Ladybird, last of that romantic clan. In itself rather a crude consummation of three adults' difficulties. But in this case Lawrence is not crude and by the magic of his touch leaves us feeling that it really is only to be expected.

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Medicoliterary Notes.

An interesting and valuable document, the reading of which would be well worth while to all physicians interested in medical education, is a memorandum entitled *Recent Advances in Medical Education in England,* published by the Ministry of Health. Sir George Newman is the compiler and writer of the document. It outlines advances made in the teaching of the preparatory sciences, in anatomy, physiology, pharmacology and therapeutics, pathology and bacteriology, the clinical study of medicine and surgery, the chief needs of clinical study, university clinics, obstetrics and gynecology, preventive medicine in medical practice; the special subjects associated with medicine, namely, pediatrics, psychology and psychopathology, ophthalmology, venereal disease, dental education, and public health. The appendices contain the revised medical curriculum of the General Medical Council, the revised regulations of the Conjoint Examination Board, and other information connected with the subject.

* * *

The Illinois *Health News* reports that a typhoid carrier who, it is stated, had an attack of this disease fifty-three years ago has been found by one of the field physicians of the State Department of Public Health. He is the owner of two cows, the milk from which was indicated as the avenue of transmission of a small epidemic of typhoid fever. This case is the oldest, in point of typhoid carrier state, that has ever come to the attention of the Illinois health officials.

* * *

Among the States reporting an increase in the number of summer cases of typhoid fever are Indiana and New York. The New York State Department of Health has urged all physicians, especially those of this city, to cooperate in all possible ways in educating people in methods of prevention.

* * *

An interesting case of rabies is commented on in a recent number of the *Journal of the American Medical Association.* A young girl in California was attacked by a mountain lion and severely bitten. She made an uneventful recovery, but seven weeks later developed hydrophobia and died from it. A boy who had been badly scratched by the lion at the same time also died. The case is of interest as it is the second on record of a mountain lion's attack on a human being without provocation; also, hydrophobia in a mountain lion is a curiosity. No other instance is on record. According to the California State Board of Health, rabies has occurred in that State in horses, mules, cattle, sheep, goats, hogs, domestic cats, dogs, wildcats, coyotes, and once each in a ground squirrel and a gray fox.

* * *

The United States Public Health Service is issuing a valuable series of pamphlets giving venereal disease information for use in its cooperative work with the State health departments. A recent issue is of special interest since it contains special articles on general paresis by Dr. Paul E. Bowers, and on the trend of venereal disease incidence; there are additional sections on the subjects of research, diagnosis, treatment, and clinical, public health, and administrative notes.

* * *

Faint Perfume, by Zona Gale, is a disappointment after her former novels, especially *Miss Lulu Bett,* which was dramatized and had a successful run in this city two winters ago. *Faint Perfume* is slight in plot, rather hectic in style, and does not seem to ring quite true as a picture of life. The character drawing of Grandfather Crumb is the one masterly stroke.

* * *

The National Health Council reports that New York State led in the amount of health legislation adopted during the sessions of recent months of the lawmakers of fourteen States. Aside from purely local measures, the majority of the laws have to do with food, drugs, tuberculosis, child welfare and municipal health.

* * *

The Manhattan Health Society, of 502 West 163d Street, furnishes to its members, for a small fee, supervision for pregnant mothers, assistance at confinements, visiting nurse care for the sick, baby health service, health supervision for children, and instruction in simple nursing care.

* * *

The Institute of Industrial Research in Washington recently made tests of the sterilizing power of paint, which showed that a painted area has a negligible bacterial growth, which may be removed by washing, and that infected surfaces may be made sterile by painting.

* * *

A report on infant mortality and its causes in Baltimore has just been published by the United States Children's Bureau. According to this report it is found that the chief conditions causing high death rates among babies under one year were poverty, employment of mothers outside the home, housing below the proper standard, short intervals between births, and the deaths of mothers at or soon after childbirth.

* * *

Lehigh University Extension School will offer during the coming year a course in the handling of backward children in public schools. The study methods will be based on observation of the occupation therapy classes in the State Hospital.

* * *

Dr. Frankwood E. Williams, medical director of the National Committee for Mental Hygiene, will give a course of lectures at the New School for Social Research on mental hygiene and its social bearings. Methods of investigation, general types of disturbed mentality, and the broad conclusions of modern psychopathology will be studied in turn.

Practical Therapeutics

THE ADVANTAGE OF INTRAORAL OPERATION IN EXTENSIVE DISEASE OF THE JAWS

By Bertram B. Machat, D. D. S.,

Brooklyn.

Success of any enterprise is frequently determined by the manner or method of its attack. This is true in surgery and particularly so in operations upon the jaws.

In extensive osteomyelitis or fracture of the maxillæ, or both, the intraoral and extraoral methods of operation are practiced; it depends largely upon the peculiar experience of the operating surgeon. Thus, in the hands of the mouth surgeon the intraoral route is the method of choice. This has proved highly successful as may be seen from the vast number of minor and major operations involving laceration which are daily performed under conditions of incomplete—oft impossible asepsis; yet postoperative complications are comparatively rare.

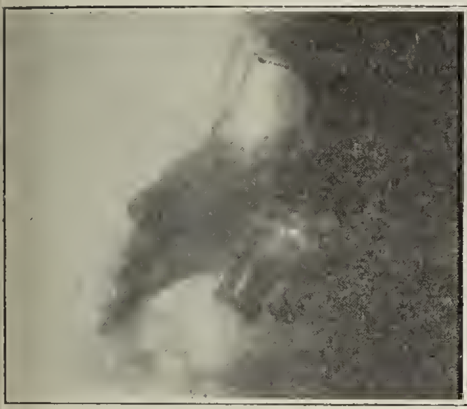

Fig. 1.

Fig. 2.

Fig. 1. Shows the right mandible before operation; decalcification and fragmentation is readily seen.

Fig. 2. Shows the condition of the left mandible following the first operation, the large dense mass in the anterior portion is due o the iodoform gauze packing, note also the large sequestrum in the region of the chin.

Contrasted with this the extraoral route is more readily accessible and permits of absolute asepsis, however, despite these added advantages—healing akes longer while postoperative sepsis is not uncommon. So, too, the extraoral approach in the removal of sequestræ or resection entails more radical surgery.

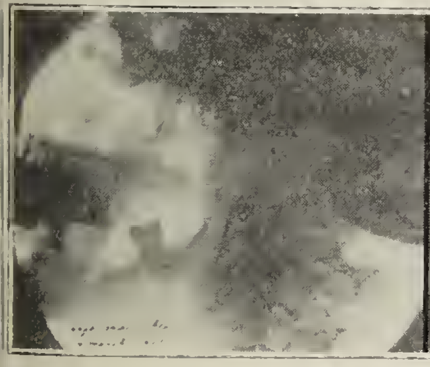

Fig. 3.

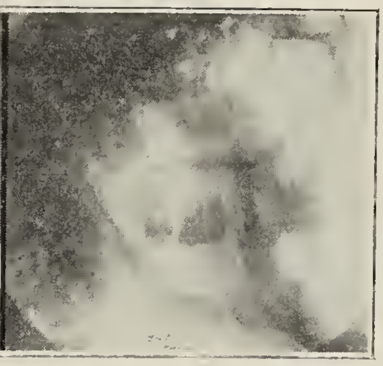

Fig. 4.

Figs. 3, 4. Show the condition of the mandible (right and left) eight months after operation. It will be seen that osteogenesis is well advanced.

Unlike other bone operations, the mere removal of extensive pathological conditions from the mandible is not sufficient for success. Indeed, rehabilitation of dental articulation and contour symmetry is extremely important, for without mandibular function and correct cosmetic result, a deft surgical operation may yield a poor prognosis.

That extensive maxillary surgery can be accomplished intraorally, in that way obviating esthetic disappointment and with less sacrifice of savable tissue may be gathered from the following case report.

It should be added that in the hands of the modern oral surgeon, block anesthesia is employed thus insuring greater safety as well as cooperation by the patient—which is a most important factor in mouth operations—while the long anesthesia affords a painless and clean procedure.

The case here reported is one of osteomyelitis of the mandible.

Case.—Male, aged fifty-one, driver, married, six children, apparently robust, presenting a nonpainful but considerable swelling of the right mandibular and submandibular region with a large copiously discharging sinus facially in the region of the first molar—was admitted in the Greenpoint Hospital, May 8, 1921.

Intraorally several discharging fistulæ extending from the right retromolar region to the left mental foramen were noted. The mouth was foul, purulent, ill kept and with the exception of four teeth in the posterior region of the left mandible—the latter was edentulous. In the maxilla, most of the teeth were in situ, but peridentally they were deeply involved, several carious teeth and root fragments obtained here.

Excepting a furunculosis several weeks prior to admission at which time, too, most of the teeth in the lower jaw were removed, the personal and family history were negative, so was the Wassermann; while Neisserian infection was denied. The blood count showed 17,000 leucocytes, eighty per cent. polymorphonuclear, seventeen small and three large lymphocytes.

On palpation a crepitous fragmentation presented while caseous like purulent substance was expressed. A diagnosis of osteomyelitis of the mandible was made.

The operation was performed intraorally under bilateral block anesthesia in two sittings: novolprocaine being the anesthetic employed. Upward of twenty sequestræ were removed, leaving, however, a substantial part of the lingual wall and lower border fairly intact. Healing took place without complication, there being no rise in temperature nor hemorrhage. The patient was discharged from the hospital May 21, 1921, and from clinic, June 15, 1921.

SOME OPHTHALMIC CONTRAINDICATIONS TO THYROID THERAPY

By Philip A. Harry, M. A., M. D.,

Rochdale, England,

Honorary Ophthalmic Surgeon, The General Infirmary, Rochdale, England.

Thyroideum siccum now occupies a foremost place among the substances prescribed by physicians and in recent years ophthalmic surgeons have come to rely more on its aid. It has proved valuable in many corneal conditions, especially where an effect on metabolism is indicated. Several authors have reported cases of uveitis benefitted by the administration of thyroid extract. James Bordley (1) described clearly the reasons for prescribing it empirically. He noticed the changes which occurred in the thyroid gland following severe infections and the part it played in the fight against these conditions, and the success gained with the use of thyroid encouraged him to record his cases.

The treatment of all forms of uveitis still leaves much to be desired and ophthalmologists have always welcomed new views on the subject. Percy Dunn (2), of London, demands a wider application for this form of treatment. He holds that the thyroid exercises a protective, antitoxic, and immunizing action, defending the body, not only against toxic products of its own metabolism, but against invasion by disease producing microorganisms and injury by their products. He thus shows hypothyroidism to be of manifest import in ophthalmic practice.

Two conditions are frequently associated with this state, namely intestinal putrefaction and septic foci such as pyorrhea alveolaris; these excite reactionary processes to which the eye shows a disproportionate responsiveness. He calls attention to the value of thyroid in the various anomalous eye symptoms complained of by patients at the menopause. Further, among the signs of thyroid inadequacy is hemorrhage. The common form of subconjunctival hemorrhage, usually attributed to gout and its analogue subretinal hemorrhage, both point to hypothyroidism in his opinion.

It has been shown that many of the conditions associated with and giving rise to arteriosclerosis could be benefitted or controlled by the administration of thyroid. It will be admitted, therefore, that the more or less empirical use of this substance has given rise in many cases to satisfactory results and has even tended to arouse enthusiasm beyond justifiable limits and although the absence of a miraculous result is no proof of its failure it may, however, serve a useful purpose to call attention to some of the limitations of thyroid therapy.

During this year in two cases that have been under treatment there developed conditions that were directly due to the administration of thyroid.

Case I.—Annie W. came up complaining of deficient vision in the left eye. There was a low degree of myopia in the right eye (—2). With the correcting lens the right vision was 6/6. Left vision 6/60, not improved by glasses. The refraction was similar in each eye. Examination of the left fundus showed a shallow detachment of the retina in the lower part. There was no history of injury. The patient had a cystic goitre and she stated that she was taking some brownish tablets which had been prescribed for the latter condition. These proved to be thyroid tablets. She was advised to discontinue the treatment. Complete rest in bed was ordered, local treatment consisted of six injections of hypertonic saline (five per cent.) at intervals of a week. The vision gradually returned and at the end of six weeks the vision was 6/9 with correcting lenses.

Case II.—Mrs. S., aged thirty, suffering from pulmonary tuberculosis, was referred for treatment of a persistent form of keratitis. Having had previous successes with the use of thyroid in various forms of interstitial keratitis her medical adviser had prescribed small doses of this substance but without beneficial result. This treatment was discontinued, and she was put on calcium lactate, ten grains three times daily, and one per cent. atropine sulphate drops locally. The corneal condition cleared up within a month. She gained weight and her pulmonary trouble was considerably alleviated.

Myles Standish (3) collected eight cases and reported three of retrobulbar neuritis with central scotoma following the use of thyroid extract. The symptoms were loss of weight, general nervous disturbances, muscular weakness, sleeplessness, deficient vision, in both eyes to 6/60 or less. Investigation of the histories showed that in one case as many as nine tablets were consumed daily.

Ophthalmoscopically the signs noticed were hyperemia of the discs without inflammation, venous stasis in the retinal vessels, pain on pressure on the globe together with absolute central scotoma.

In all cases the symptoms improved when the thyroid was discontinued. According to Birch Hirschfield and Inouye (4) in the case of experiments on dogs the anatomical changes found were degeneration of the ganglion cells of the retina with secondary degeneration of the optic nerve fibres.

This form of toxic amblyopia bears clinical resemblance to the variety produced by tobacco, and responds to the same methods of treatment. It is necessary, therefore, in the administration of thyroideum siccum to watch for symptoms of intolerance in susceptible patients.

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TREATMENT OF SYPHILIS WITH AMINOARSENOPHENOL OF POMARET

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New remedies, coming from reliable sources, advanced for the treatment of syphilis, which simplify the methods of administration and show results equally prompt and efficacious as the standard preparations already accepted, merit our careful consideration.

Jeanselme, of the Paris Faculty, is a recognized authority, and in conjunction with Pomaret has recently expressed his warm interest in a new arsenical product, aminoarsenophenol, or 132 of Pomaret, now introduced into commerce under the name of Eparseno.

Pomaret's preparation is the aminoarsenophenol of Ehrlich (base, or active body of all the arsenobenzol or novarsenobenzol compositions) but an aminoarsenophenol made stable and soluble in an organic alkaline medium. It is a brown, syrupy liquid containing forty per cent. arsenic, twice as much as is ound in neosalvarsan and other similar preparations. Rabbits have supported a dose by intravenous injec-on of 0. gr. 15-0 gr. 16 to the kilogram of weight, nd mice weighing twenty to twenty-five grams, a ose of six to seven milligrams injected under the kin. It, therefore, is not more toxic to these ani-als than the other arsenobenzols. It is a prepara-on of marked stability, remaining unaltered at a tem-erature of 70° C., which permits its being sterilized y heat. It is prepared in ampoules, ready for intra-uscular injection without the addition of either nalgesic or anesthetic.

The experimental researches of Jeanselme and Pomaret have shown: 1. The spirillicide action and herapeutic efficacy of the aminoarsenophenol, in the pirilla of fowls and experimental syphilis of the abbit. 2. Its comparatively feeble toxic action. 3. ts innocuousness by injection into the muscle or into e veins.

Dr. E. Lepinay, of Casablanca, has published (1) résumé of his observations in the treatment of irty-three cases of syphilis, in both black and white atients, with the express purpose of determining e value of this new preparation. Eight of these ubjects were intolerant of the arsenobenzols. Sixty-ight intravenous injections were administered and 90 intramuscular. In all of the cases but one, the njections were perfectly well supported; in one case, venty minutes after the second intravenous injec-on, the patient was seized with a nitritoid crisis, ith chill, congestion of the face, trembling, tachy-ardia, epiphora, thoracic constriction, etc., all of hich at once disappeared following a hypodermic f adrenalin. The patient was one that had shown ntolerance to novarsenobenzol. Later this patient upported, without any untoward symptom, the in-amuscular injection of a dose as high as twenty-five gm. of the remedy, and at the writing of this report as undergoing his second series of injections.

By intramuscular injection eparseno is used as it omes in the ampoule, without any other prepara-on. The injections are made by preference in the rea of the thigh muscle and are fairly deep. The rimary dose was usually one centimetre cube, fol-owed three or four days later by a dose of two cen-metre cube, repeated regularly every four days. number of the patients were given without inter-uption from twelve to fourteen injections in from orty-five to sixty days forming a total dose of from .80 gr. to 3.50 gr. of eparseno, corresponding to rom 5.75 gr. to 7 gr. of novarsenobenzol. After a elay of from three weeks to one month, some of ese patients were put upon a second series of njections.

The injections were universally well tolerated and ave rise to little if any pain. A certain number of atients complained of a burning sensation at the oints of the piquer and some complained of a sense f swelling. This sense of discomfort invariably isappeared within a few moments, and in only one r two cases did it persist as long as two hours. In o case did it prevent the subject from walking, and ll were able to continue almost immediately their everal occupations. No injection was followed by ny signs of local area of induration.

No fixed hour was selected for giving the injec-ons; they were given morning, afternoon, and evening; before and after meals. In no case was intolerance shown to this remedy, and in only a few of the cases was any elevation of temperature observed and never more than to the extent of a few tenths of a degree, six or eight hours after the injection. Some of the patients complained of cerebral congestion and headache; in two of the cases of secondary syphilitic manifestations these symptoms were particularly accentuated a few hours after the first two injections of 0. gr. 125 and 0. gr. 25 made three days apart. After the second injection these troubles disappeared. In none of the cases was there observed any change in the pulse, respiration, or arterial tension.

The absorption and diffusion of the eparseno throughout the system are extremely rapid if one may judge by its elimination through the urine. Within one hour after the injection arsenic is discovered in the voided urine. The azoreaction is strongly positive in the first urine voided, diminishing in intensity as the day progressed, but was still evident in tests made twenty-four, forty-eight and sometimes seventy-two hours after the injection. It would appear, therefore, that the intramuscular administration of aminoarsenophenol is retained for a longer time in the circulation than after its intravenous introduction, and without apparent accumulation; it is much more slowly eliminated. In none of the urinary tests was there ever discovered any albumin or glucose, and no clinical reaction was ever shown in the liver. In common with all arsenical preparations, the administration of this remedy is generally followed by an increase in the appetite, weight, and general strength.

After the completion of a second series of injections, separated only by one month of rest and consisting of five, six, and seven grams of eparseno, corresponding to ten, twelve and fourteen grams of novarsenobenzol, no evidence appeared in any of the patients of intolerance to the remedy or of arsenical saturation. Eight of the subjects treated were intolerant of intravenous injections of novarsenobenzol, as shown by nitritoid crises and evidence of shock, and one of these patients was intolerant of the eparseno by intravenous injection, but together with the other seven, supported perfectly the introduction of eparseno by the intramuscular route equally large and larger doses than those that gave rise to the prohibitive manifestations by the intravenous route. All were subjected to the completed series of injections and some have been placed upon a second series.

The therapeutic results following the administration of this remedy are clinically identical with those of salvarsan, neosalvarsan, or 102. The treponemas have disappeared from the chancre after the second injection of 0. gr. 25, and in one case after a single primary injection of two centimetre cube (0. gr. 25), proof of the evidence that 0. gr. 25 is required to bring primary syphilis under control; after the second injection the aspect of the chancre is modified and cicatrization commences, and in general is definitely completed in from eight to fifteen days, following the extent of the lesion.

The patients treated presented all the different phases of the malady: mucous patches, papulous syphilides, squamous syphilides, crusts, syphilides palmair and plantair, hypertrophied papulous syphilides, with erosion and other manifestations generally termed tenacious, permitting a clear observation of the evolution of these signs following the treatment.

The treponema found in the mucous patches of one of the patients disappeared the fourth day after the second injection of 0. gr. 25. In some of the cases the roseola disappeared after the first injection, but more often after the second injection (0. gr. 37). The mucous patches became dry and the papulous or the papuloerosive syphilides were reabsorbed after the second or third injection (0. gr. 37 to 0. gr. 62). The papulosquamous syphilides and those with crusts as well as the palmar circinate syphilides become bleached after the third or fourth injection.

The action upon the cephalalgias and the astralgias and the ostalgias were immediate; the pains completely disappeared after the first or second injection.

It was found that the action of eparseno showed rapidly in tertiary syphilis. From the first injections the tuberculous syphilides commenced to disappear and the tuberculous ulcerous syphilides, as well as the gummary ulcers, were modified and commenced to cicatrize. The time necessary for complete cicatrization depended upon the extent and depth of the lesions, but all of them were progressively and rapidly cured. One case of tabes that was intolerant of novarsenobenzol supported perfectly without reaction six injections of 0. gr. 25 repeated every four days.

The Wassermann tests showed little if any deviation from the well established results following the employment of salvarsan.

The commercial introduction of this remedy is too recent and the number of clinical observations recorded are hardly sufficient to place a definite value or appreciate the length of time to which the cures may extend, but from the published reports the following conclusions may be drawn.

CONCLUSIONS.

1. Eparseno is an arsenobenzolic preparation, twice as rich in arsenic as similar preparations and has shown itself to be no more toxic.

2. Therapeutically eparseno has shown itself to be fully as efficacious as any of the other known remedies for syphilis at all of its stages, and in any and all of its manifestations, and possesses the advantage of simpler and less technical application by intramuscular injection.

3. The intramuscular injection of eparseno shows an equally rapid action in the control of all the syphilitic manifestations to any of the other remedies employed intravenously.

If the prolonged use of eparseno confirms the good results already obtained and shows a permanency of effect equal to that of the other remedies at present employed, it will permit of the introduction into the organism of a much stronger dose of arsenic in a smaller volume which must certainly guarantee, therapeutically, a much more powerful assault upon the malady than is permitted by the intravenous route, and it would seem to promise to minimize the risks and accidents that have attended arsenical medication.

It seems to give reasonable promise of the application of arsenotherapy in those cases which are intolerant to intravenous injection and will greatly simplify the use of arsenic in the treatment of this dire malady.

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Treatment of Suppurative Otitis Media With Small Perforations in the Ear Drum.—Theodor v. Liebermann (*Weiner klinische Wochenschrift,* March 15, 1923) states that enlargement of the perforation in the ear drum does not aid in drainage or in admitting medication to the Eustachian tube. The treatment as carried out by the attending physician is as follows: In order to have the medication reach the Eustachian tube, the olive of the Politzer bag is fitted to the external auditory canal after it is thoroughly cleansed and the patient is instructed to swallow several times in order to produce variations in the pressure and allow the medication to reach the Eustachian tube, no matter how small the perforation in the drum may be. In order to make this overpressure also available to the patient for selftreatment, he is instructed to irrigate the ear with three per cent. boracic acid solution and then to fill the auditory canal with three per cent. hydrogen peroxide solution by means of a ball ear syringe, the canal being immediately compressed with the end of the finger or the tragus until either a slight attack of vertigo is felt or the medication is felt to trickle into the pharynx. The act of swallowing aids this procedure. In advanced cases without swelling, the peroxide solution may be immediately mixed with three per cent. boracic acid alcohol or a five tenths per cent. alcoholic salicylic acid solution. To remove the swellings in the Eustachian tube alcohol has been recommended, but the author prefers alcohol only when the secretion is slight in amount. In fresh cases he prefers the use of adrenalin preparations to relieve the swelling, after which he uses the medication indicated. With large prolapses, he applies locally such caustics as silver nitrate, solutions of chromic or trichloracetic acids, or the galvanocautery.

Treatment of Cerebrospinal Meningitis.—Jose de Toledo Piza (*Annals Paulistas de Medicina e Cirurgia,* July-August, 1921) gives the treatmen which is used in Brazil. In a suspected case of cerebrospinal meningitis, a lumbar puncture should be done and if the fluid is turbid there should be administered antimeningococcic serum regardless of the bacterial examination. This gives the double advantage of avoiding the inconvenience of later puncture for serum treatment, and of instituting treatments a once. The prognosis depends upon an early diagnosis and the method of utilizing the specific serum which should be injected intraspinously in quantitie somewhat less than the fluid removed from the spina canal, but should not be less than twenty c. c Grave cases do well with forty c. c., with a repetition of the initial dose the following day, and twenty c. c every two days until recovery is assured. The same doses may be given either intravenously or intramuscularly; the writer has never had any untoward effects from the intravenous route. Apart from th serum, the only other therapeutic measures are th application of ice bags, the administration of hexamethylamin, and the injection of cardiac supportives

Abstracts from Current Literature

Etiology of Yellow Fever.—Hideyo Noguchi (*Journal of Experimental Medicine,* September, 1922) reports experiments in which guinea pigs were used to determine the duration of the protective effect of an injection of antiicteroides immune serum. The animals were given different quantities of the immune serum and subsequently injected at various intervals with a virulent strain of Leptospira icteroides. Complete protection lasting five days was given with as minute a quantity of serum as 0.002 c. c. per 1,000 gm. of body weight. After this period, however, the immune substance rapidly diminished, and to keep the animal protected for as long as ten days, it was necessary to give 100 times as much, or 0.2 c. c. Therefore for a man weighing 80 kilos, 0.16 c. c. would theoretically be sufficient to protect for at least five days, 1.6 c. c. for seven days, and 16 c. c. for ten days. Noguchi states that this temporary protection may be a valuable antecedent to that furnished by vaccination, since the final effect of the latter cannot be expected until at least nine or ten days have passed.

The Hydrogen Ion Concentration of Joint Exudates in Rheumatic Fever and Other Forms of Arthritis.—Boots and Cullen (*Journal of Experimental Medicine,* October, 1922) determined the hydrogen ion concentration of joint exudates of patients with acute rheumatic fever, which varied from pH 7.27 to 7.42. The fluids from patients with arthritis of undetermined origin varied in their pH from 7.33 to 7.47. All these reactions were slightly alkaline and approximated the normal reaction of blood. The joint fluids of two patients with bacterial arthritis were both definitely acid. The conclusion is offered that since a definitely acid medium is necessary for the liberation of free salicylic acid, and since all of the joint fluids from cases of acute rheumatic fever were slightly alkaline, no free salicylic acid could possibly exist in such joints following the administration of salicylates.

Diazo Reaction and Its Relation to the Leucocyte Content of the Blood.—N. Svartz (*Hygeia,* 34: 869, November 15, 1922) in his efforts to demonstrate a relation between the diazo reaction and the leucocyte content of the blood, made a study of seventeen cases of typhoid, paratyphoid, and pulmonary tuberculosis. In these cases the leucocyte count falls as the diazo reaction becomes stronger and vice versa. There is no absolute parallelism to be demonstrated but it must be admitted that some kind of relation exists between the two. Discrepancies may be accounted for in several ways. The method of taking the blood count cannot be said to be exact, variations in the concentration of the urine, and the effect of various drugs on the diazo reaction may all modify the results. The cases prove, however, that some form of relation exists between the diazo reaction and the leucocyte count. In searching for a basis for this relationship the most plausible explanation would seem to be that as a positive diazo reaction is found in the great majority of cases combined with leucopenia, the reaction might depend on decomposition of the white blood corpuscles. Diazo reaction cannot be demonstrated in the blood serum, but this does not necessarily exclude the possibility of the reaction being due to decomposition of the white blood corpuscles. If leucopenia is considered as a symptom of toxic disturbance of the blood forming apparatus and as having nothing to do with blood decomposition, then of course diazo reaction cannot be considered as having any etiological connection with leucopenia. It is probable that the same factor is responsible for both diazo reaction and leucopenia and at present it is impossible to demonstrate any causal relation between the two.

Treatment of Pulmonary Tuberculosis.—Clive Riviere and W. H. C. Romanis (*Lancet,* March 17, 1923) conclude that chest operations rapidly and skilfully carried out under gas and oxygen anesthesia are remarkably well tolerated by tuberculous patients, much better than preconceived ideas would have suggested. The gas and oxygen anesthesia is preferable to local anesthesia. The authors favor, so far as possible, extrapleural operations rather than the intrapleural division of multiple adhesions. Of extrapleural operations, the stripping of parietal pleura from the deep fascia (pneumolysis) is the simplest and shortest, provided a suitable medium could be discovered for filling the space. It has the advantage that localized collapse can be applied to localized disease, without the necessity of complete lung collapse. Pneumolysis is undoubtedly accompanied by real risk of sepsis. The establishment of an intrapleural pneumothorax is somewhat difficult and not without risk; adipose tissue, as a filling, is difficult to obtain; paraffin is apt to be returned. This latter accident is probably avoided, in threatening cases, by the aspiration of serous fluid, which tends to be formed and to collect round the paraffin in these cases. The efficacy of paraffin replacements is probably reduced by the fact that no such immobilization of the collapsed area occurs as after extensive rib resection. Furthermore, the localization of the collapse is also, probably, less than might be hoped for. For the majority of cases in which operative measures are needed for the collapse and immobilization of an adherent tuberculous lung, a well devised thoracoplasty seems to offer the best results. The operation is less severe, in skilful hands, than might be expected, and the conditions obtained are very favorable for the arrest of pulmonary tuberculosis. The better lung must be scrupulously investigated and the best moment chosen for the operation. A reactivation on the side of operation may be met by further resection of the ribs, but an extension of disease in the functioning lung admits of no amelioration. This operation, if indications and contraindications are strictly followed, is likely to gain a wider acceptance in coming years.

The Epidural Injection of Antipyrin in Sciatica.—Fr. Högler (*Wiener klinische Wochenschrift,* December 14, 1922) reports some very good results from the epidural injection of ten to twenty c. c. of an aqueous solution of from one to four gm. of antipyrin. The injection should not be repeated before two days. If the sciatic pains are limited to the legs, the perineural injection is sufficient, but with pains in the region of the radicles of the sciatic nerve the epidural injection is immediately indicated. The epidural injection is made in the hiatus sacralis, which allows the medication to reach all sciatic nerve radicles. The site of injection is determined as follows: The sacral cornua are palpated and between and below them an indentation is felt, in the center of which a needle 8 cm. long and not too thin is introduced vertically to the axis of the canal. The piercing of the connective tissue membrane covering the hiatus is determined by the lack of resistance. The needle is then turned at an angle of 90°, so that it lies parallel to the sacral canal, and it is then pushed further in this direction for a distance of four to eight cm. There is no danger of injuring the nerve root as the mere touching of it produces pains and defensive movements. If this should happen, the needle is slightly withdrawn and the fluid is injected without danger. The patient is then allowed to lie in a dorsal or prone position for several hours. The knee-elbow position is the best. With anesthesia of the skin the procedure is painless. Neuralgic pains, frequently associated with sciatica, especially in the adjacent regions of the femoral and lateral cutaneous femoral nerves are also relieved.

Mercuric Chloride Poisoning With Recovery.—Funk and Weiss, (*Journal of Laboratory and Clinical Medicine,* January, 1922) report a case of bichloride poisoning with recovery following intensive eliminative treatment, the case being recorded in order to present the functional studies, which include the ureaconcentration test of McLean and DeWesselow. If this test is generally to be adopted the observation made in this paper, namely as to the comparative innocuousness of administered urea, is important.

Generalized Analgesia After Exposure to Some War Gases.—John Auer (*Journal of Experimental Medicine,* February, 1922) reports investigations on cats gassed with dimethylsulfate or chloropicrine in such concentration that death occurred usually within four days. The animals usually showed a marked generalized anesthesia, both superficial and deep, and reacted with no obvious sign of pain to operative procedures such as laparotomy and gentle friction of the parietal peritoneum. The analgesia developed within a few hours after gassing, reaching its maximum in about twenty-four hours. It may persist for six months with dimethylsulfate, while with chloropicrine practically normal sensitiveness was observed seven days after gassing. Auer explains this analgesia on the basis of a general, low grade, tissue asphyxia, which is chiefly of pulmonic origin.

Blood Destruction in Pernicious Anemia.—Winifred Ashby, Ph. D., (*Journal of Experimental Medicine,* August, 1921) carried out this investigation on thirty-three patients with pernicious anemia, not of Group 4, who received Group 4 transfusions, to determine the mechanism by which blood destruction is brought about, by means of studying the elimination of the Group 4 transfused blood. During a series of transfusions while some of the pernicious anemia patients under observation showed at certain times much blood elimination, on the whole, blood destruction was quiescent. From the evidence presented, Ashby believes that there is no hemolytic toxin producing the anemia in pernicious anemia, and that it is a question whether blood destruction is as important a factor in producing this disease as is generally supposed.

Study of Transfused Blood.—Winifred Ashby (*Journal of Experimental Medicine,* August, 1921) concluded from a study in which Group 4 blood was transfused into a recipient of unlike group that the length of time the transfused blood remains in the circulation varies greatly. The elimination does not appear to be a continuous process, but occurs in more or less cyclic crises, which in women are coincident with menstruation.

Angina Pectoris.—J. Pal (*Wiener Archiv für innere Medizin,* Volume vi, No. 1) asserts that angina pectoris is an angiospastic crisis in the region of the coronary vessels and the root of the aorta. This particular excitability and the predispositon to these attacks in these regions are produced by changes (mesaoritis, atherosclerosis at the insertions of the coronary arteries and endocarditis of the aortic valves) or only by functional causes. In the presence of a predisposition to the attacks, psychic disturbances and sensory stimuli (cold and painful stimuli) may affect this zone. The attacks are associated with circulatory disturbances, which are either coordinated and expressed in a rise in blood pressure (pressore vascular crises) or resultant conditions in the heart (cardiac crises). The vasomotor nature of the attacks is evidenced not only by the prompt action of drugs which have an elective vasodilator effect on the coronary region (like caffein, theobromin, atropin, etc.) and the remedies which have a general spasmolytic effect (papaverin, and the entire benzyl series and the nitrites), but also by the effect of heat and particularly that of fever. An effective therapeutic remedy is the ingestion of hot water. Of other remedies, those that can be administered intravenously deserve the preference because of their immediate effect. These include papavrin, novatropin and their combinations.

Generalized Megalocaryocytic Reaction to Saponin Poisoning.—J. Firket and E. S. Campos (*Bulletin of the Johns Hopkins Hospital,* August, 1922) were led to undertake this investigation through observing a peculiar case of extreme anemia in which there was complete aplasia of the bone marrow, together with a new formation in the liver and spleen of myeloid tissue in which megalocaryocytes predominated. In attempting to imitate the picture, they were able to produce a similar condition in rabbits by saponin poisoning. Their study brought out the following results: After intravenous injections of saponin in rabbits the resistance of red cells to this drug does not show any marked change. The red cells of splenectomized rabbits are not different in their resistance of saponin from those of normal rabbits, although they are more resistant to hypotonic salt solution. Saponin is a highly destructive agent for blood platelets both in vivo and in vitro. The intravenous injection of saponin into rabbits produces in the bone marrow hyperplasia, and, simultaneously, numerous diffuse or circumscribed foci of hemorrhage; there is not a true aplasia. As the function of the bone marrow is impaired by hemorrhages and their effects, the spleen, liver, and other organs show a vicarious myeloid foundation. This newly grown myeloid tissue shows an unusually large number of nucleated red blood cells but mainly megalocaryocytes—megalocaryocytic reaction. This reaction was observed in the lymph glands after intravenous injection of saponin in splenectomized but not in nonsplenectomized rabbits, and may be explained as a vicarious function. The megalocaryocytes found in the bone marrow, spleen, liver and other organs of the rabbits injected with saponin, were not all identical in structure. For a good understanding of the pathological changes in the bone marrow, the authors emphasize the fact that it is important to study large longitudinal sections (of almost the whole organ in rabbits) and cross sections of the marrow of several bones.

Apparent Recovery From Hodgkin's Disease Through Deep X Ray Therapy.—P. Jacob (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris,* May 10, 1923) reports the case of a woman aged thirty years who sought treatment for dyspnea and large glandular masses in the neck, especially on the left side. A subfebrile temperature had frequently been present for about two months. There was cough, but little sputum, and no tubercle bacilli. A very marked Claude Bernard-Horner syndrome was present on the left side, denoting pressure on the sympathetic. Fluoroscopy showed a shadow occupying the upper half of the left pulmonary field; below this shadow, slightly lateral to the pedicle of the lung, was an opaque spot three or four centimetres in diameter. The diagnosis was confirmed by blood examination and histological examination of an excised piece of enlarged gland. Under twelve deep x ray treatments the glandular enlargements almost completely disappeared, and the lung was markedly cleared, though some radiating dark streaks persisted. The symptoms disappeared, though the Claude Bernard-Horner syndrome showed little change. Some doubt exists as to the permanence of recovery, but the favorable early result testifies to the efficacy of x ray treatment in some of these otherwise refractory cases.

Pathogenesis of Celiac Disease.—As a result of the study of the literature and a clinical study of some of his own cases, Reginald Miller (*Archives of Pediatrics,* February, 1923) comes to the conclusion that celiac disease should be regarded not as an organic disease but as a digestive disorder affecting fat absorption. The exact nature of this disorder is more of a moot question: by a process of exclusion he is led to regard some disturbance of the normal function of the bile salts as the most likely factor, and further research will probably add to the evidence in favor of this conclusion.

Observations Upon Cardiac Rheumatism of Childhood.—Martin O. Raven (*Lancet,* February 3, 1923) shows the desirability of prolonged recumbency in every case of cardiac rheumatism and that the earlier this treatment is initiated, the less prolonged it is likely to have to be. Compared with a policy of physical and emotional rest, fresh air and warmth, such influences as climate cannot be taken into much account. Similarly, treatment by drugs, useful though they undoubtedly are—particularly salicylates, digitalis and opium in appropriate cases —is properly regarded only as accessory to a general management on these lines. In the case of poor people, this policy can only be attempted in institutions devoted to that purpose. Rheumatic carditis, owing to the insidious mode of its onset, will never be prevented from permanently undermining the health of children, unless it is by means of notifications brought under the eyes of responsible medical officers in its early stages.

Properties of Certain Colloidal Preparations of Metals.—The physicochemical tests employed by A. J. Clark (*British Medical Journal,* February 17, 1923) indicate that the active principles of some of the colloidal preparations investigated are entirely in the colloidal form; in other cases the active principles were partly in colloidal form and partly in true solution; while in some cases the whole of the active principle appears to be in true solution. The pharmacological tests employed failed to show any marked difference between the action of the colloidal preparations tested and the action of the same substances in true solution.

Diphtheria of the Nose.—Friedrich Göppert (*Monatsschrift für Kinderheilkunde,* A. Czerny Festschrift, March 25, 1923) emphasizes the fact that positive bacteriological findings do not always prove the presence of diphtheria and also that negative findings do not disprove its presence. The most important diagnostic feature is the typical membrane, though other infections may also produce it. Bloody secretion, though not commonly found, is an important sign. Some of these cases go to the chronic stage. A unilateral atrophic rhinitis, with or without an odor from the nose, should always lead to the suspicion of diphtheria.

Nature of Arteriosclerosis.—Geoffrey Evans (*British Medical Journal,* March 17, 1923) states that the main feature of diffuse hyperplastic sclerosis is a thickening of the intima, accompanied sometimes by hypertrophy of the media. The intimal changes are the essential lesion. Activity of the endothelial cells is largely responsible for the intimal thickening. In this thickening the process of degeneration plays a secondary part; it is only certainly present in the terminal arterioles of the kidney and the smallest vessels of the other organs. The characteristic feature of the lesion is an intense tissue activity, which is the very antithesis of the process of decay.

Rheumatism and Its Manifestations in Children Under Five Years.—Alonzo de G. Smith (*Archives of Pediatrics,* December, 1922) states that the pathology of rheumatism is not characteristic. Rheumatism is rare in children under five years of age and almost unknown in those under two years of age. As seen in childhood it differs from the adult type of rheumatism in the greater frequency of carditis and the associated syndromes. There are no symptoms that are found particularly in children under five years old. The conditions to be differentiated are scurvy, rachitis, syphilis, osteomyelitis, gonorrhea and tuberculosis. The immediate prognosis as to life is favorable in these children.

The treatment should be directed along the lines of

1, prophylaxis; 2, control of the fever and pain; 3, lessening of the arthritis; 4, the prevention of cardiac disease. The importance of proper clothing (flannels) and the avoidance of dampness and climate should be emphasized; also the necessity of tonsillectomy (where necessary) and the significance of socalled growing pains, restlessness, night terrors and habit spasms. Salicylates control both fever and pain, sodium bicarbonate being added to allay gastric irritation, or they may be given in starch enemas. Locally, the joint is wrapped in cotton, or lambs' wool soaked in lead and opium water, belladonna liniment, or it is rubbed with oil of wintergreen. Splints may be necessary. No drug will prevent cardiac involvement, but prompt and prolonged rest in bed is most important. The heart should be examined daily for signs of pericarditis. When present, icebags, cupping, blisters, leeches, and aspirations are indicated. After the attack has passed off, salicylates should be administered for periods of five to seven days in each month. The aftercare includes the administration of a suitable diet, Fowler's solution, iron and codliver oil. Suitable graduated exercises under direction will strengthen the myocardium.

Pathogenesis of Spasmophilia.—Richard Lederer (*Monatsschrift für Kinderheilkunde,* A. Czerny Festschrift, March 25, 1923) advances the following working hypothesis in regard to the pathogenesis of spasmophilia: The infantile form of spasmophilia is a constitutional anomaly, produced by a primary disturbance of the balance of the free alkali and earthy alkali ions with a marked preponderance of the former and lessening of the latter. The changes in the hydrogen ion concentration of the blood, body juices and tissues and the appearance of toxic metabolic products (amino bases, etc.) are produced thereby only secondarily. The question whether this disturbance of ionic balance is produced by the loss of parathyroid function or the disturbance of several endocrine glands remains unanswered and naturally pushes the investigation a step further back.

Roseola Infantum.—After studying a series of sixty cases of roseola infantum, H. O. Ruh and Justin A. Garvin (*Archives of Pediatrics,* March, 1923) describe roseola infantum as follows: This disease is a noncommunicable febrile disturbance of unknown origin occurring in infants and young children, having no complication and terminating by crisis in three to five days, following which there appears a rubellaform rash. The majority of their cases occurred in the late spring. The age incidence is usually from six months to two and a half years, rarely up to fourteen years. The period of incubation is unknown; the period of invasion is three to five days. Its onset is abrupt, usually with a temperature of 38.5° C. The temperature rises to 39° C. to 40° C., rarely as high as 42° C., with irregular remissions. In spite of the fever, the patient does not appear alarmingly ill, irritability and a poor appetite being the chief accompaniments of the fever. Usually on the fourth day of the disease, or sometimes as early as the third or as late as the sixth day, the temperature drops by crisis to normal or subnormal. The rubellalike rash appears within a few hours on the neck and spreads to the face, trunk and extremities; it usually becomes less marked as one proceeds toward the periphery. It is papular and maculopapular up to pea size, usually discrete, pale red, not blotchy and it does not itch. It reaches its maximum in twelve to twenty-four hours and disappears within forty-eight hours, leaving no pigmentation or desquamation. The mucosa over the fauces, tonsils and pharynx is reddened. There is no adenopathy. The blood shows leucopenia and relative lymphocytosis. The prognosis is good. During the febrile period the differential diagnosis from scarlet fever, measles, rubella, influenza and variola may be difficult.

Injection of Alcohol in the Treatment of Prolapse of the Rectum in Infancy and Childhood.—Leonard Findlay and J. B. Douglas Galbraith (*Lancet,* January 13, 1923) perform their operation under full anesthesia and the lower bowel emptied by an enema. The prolapse is reduced. With the finger in the rectum to act as a guide, 1.5 cm. of absolute alcohol are injected on each side into the perirectal tissue at a depth of 2 to 2.5 inches. The needle of an ordinary exploring syringe is inserted on each side about one quarter of an inch from the anal margin. The needle punctures are sealed with collodion, a pad is placed on the perineum and kept in position by strapping the buttocks firmly together. The child must be allowed to move the bowels only while in the recumbent position, the feces escaping by the side of the dressing. The pad and strapping are reapplied daily for a week.

The Wassermann Reaction.—Barton F. Hauenstein (*Bulletin of Buffalo General Hospital,* April, 1923) concludes: 1. That the Wassermann reaction with the Kolmer antigens, while the procedure is more complex, is superior to the older methods. 2. By this method the specificity of the test is increased, while the nonspecific complement binding factor is greatly diminished, the weak or doubtful positive results being thus reduced to a minimum. 3. The Kahn precipitin test, judging from the little experience with it, cannot replace the Wassermann reaction.

Idiopathic Priapism.—James C. Sullivan (*Bulletin of Buffalo General Hospital,* April, 1923) reports a case of priapism which was apparently produced by a tonic contraction of the ischiocavernosus muscle. The thrombosis of the corpora cavernosa, although it helped to maintain the erection, must be considered as a secondary event, since the emptying of the clots only temporarily relieved the situation, and not until all the fibres of the muscle were severed could permanent relief be effected. The original cause of the priapism was not determinable. Leukemia, syphilis, disease of the central nervous system and trauma were not present. The past history was absolutely negative. This is a rare condition.

Simple Test for Sugar.—John Livingston (*British Medical Journal,* May 6, 1922) reports that a drop of urine containing sugar evaporated on a glass slide over an alcohol flame leaves a socalled tacky glistening film of syrup. Further heating produces a rich golden color and full heating converts the deposit into burnt sugar or caramel. Urine containing fourteen grains of sugar to the ounce gave the reaction after a five fold dilution with water.

The Relationship Between the Pancreas and e Neuroses.—F. Pineles (*Wiener Archiv für nere Medizin,* Volume vi, No. 1) states that ner- us disturbances of the heart (anxiety, cardiac ins, pseudoangina and tachycardia) are associated ider certain conditions with copious fatty stools, imentary glycosuria, emaciation, Loewi's pupillary action, etc. Inasmuch as the latter point toward disturbance of the function of the pancreas, the sumption of a pathogenic relationship between the sturbances of the heart and the pancreas seems asonable. In the same way do many of the factors patients who belong to the socalled Basedowoid trumous neuropathy) and the patients who suffer ith socalled nervous diarrheas speak in favor of a ose pathogenetic relationship of these symptoms ith the pancreas.

Syphilis With a Negative Wassermann Reac- on.—C. Morton Smith (*Boston Medical and Sur- cal Journal,* August 23, 1923) groups cases of iown syphilis which yield a certain number of gative Wassermann reactions. These are: 1. Early imary syphilis. 2. Late syphilis, a, latent; b, cases ith sharply localized areas of activity; c, tabes with gative blood and positive spinal fluid; d, late lues mulating malignancy. 3. Early infancy. 4. Late ngenital cases with active skin lesions, periostitis, terstitial keratitis, etc. 5. Certain cases under tive treatment with mercury and arsphenamine. arly primary lesions should yield about ninety to nety-five per cent. of positive results by dark field amination and only a small percentage of positive assermann reactions.

X Ray Examination of the Chest.—Hudson and utton (*Lancet,* March 7, 1923) state that an in- pert opinion on a röntgenogram is valueless and ten misleading. A good röntgenogram of a normal iest shows distinct mottling and hilum shadows hich need not be referable to tuberculosis. A ntgenogram may sometimes demonstrate much ore extensive disease than physical signs reveal, id may sometimes be the sole means by which a agnosis can be made. Röntgenoscopy and rönt- nography are essential before undertaking and iring the continuance of artificial pneumothorax.

Heart Murmurs in Infancy and Childhood.— ohn Lovett Morse (*Boston Medical and Surgical urnal,* September 6, 1923) finds that a systolic urmur in the pulmonary area, that is, in the second id third left interspaces, is common throughout rly life. It is so common that it may be regarded physiological. It is always soft and blowing in aracter and systolic in time. The only condition ith which it might be confused is a congenital sion at or near the pulmonary orifice, but when ere is such a lesion there is often a thrill and e murmur is usually rough, loud and transmitted to the neck and back. The right side of the heart often enlarged and the second pulmonic sound is most invariably weakened, and there are usually her evidences of cardiac disease, as clubbing of the gers, cyanosis, bulging of the precordia and dis- rbances of nutrition. A diastolic murmur in the rtic area without cardiac enlargement is usually inctional. A precordial murmur in an infant unless ainly due to a congenital lesion is generally not organic before the child is four or five years old. Such a murmur does not necessarily indicate organic heart disease. No examination of the heart is complete and no conclusions justified unless the size of the heart, the character of the sounds, the condition of the child, and the intensity of the second pulmonic sound are investigated.

Differential Diagnosis of Acute Abdominal Conditions in Childhood.—James S. Stone (*Boston Medical and Surgical Journal,* August 30, 1923) emphasizes both the importance of a history in these cases and the difficulty of obtaining it. A point of value in differentiating abdominal muscular spasm of thoracic conditions from that of abdominal conditions is that in the former palpation of the abdomen has a tendency to relax the spasm, while in the latter spasm increases as the muscles attempt to prevent pressure on a tender spot. Conditions to be thought of and differentiated are appendicitis, pyelitis, enlarged mesenteric glands, Pott's disease with girdle pains, and tuberculous peritinitis. Obscure abdominal lesions with a low white count and a positive Pirquet reaction are likely to be tuberculous peritonitis. Intussusception is the great surgical emergency in infancy, and here fortunately the symptoms are characteristic, namely, sudden onset with pain and shock; pallor, cold sweat, reflex nausea or vomiting; mucus, bloodstained mucus, and then blood in the stools. A painstaking history taking may eliminate many conditions even before the child is seen. Then see everything that can be seen, and feel everything that can be felt, including what can be felt in the pelvis by rectal examination. When the examination is finished, consider the whole picture and the history. Then will come the need for laboratory aids, white cell count, Pirquet, urinalysis, and x ray. The latter is of value in certain cases but sometimes involves dangerous delay and harmful manipulation.

Isolation of White Blood Cells.—Paul Szilard (*Journal of Laboratory and Clinical Medicine,* July, 1923) reports in detail a simple method whereby white blood cells can be isolated almost quantitatively from a small volume of blood. The essential point of the procedure is the destruction of the red blood corpuscles and the thrombocytes in a manner which will leave the white cells unimpaired. In a mixture of acetic and tartaric acid the while blood cells scarcely suffer at all. The solutions used are a 2.5 per cent. solution of acetic acid; two per cent. solution of tartaric acid; two per cent. solution of potassium hydroxide, and Locke's solution. The acetic and tartaric acids are used for hemolysis. The acid mixture is poured quickly into the blood until hemolysis takes place. The quantity of alkali necessary to neutralize the acid mixture to phenolphthalein is determined, and for each ten c. c. of blood one c. c. more than the quantity of alkali required for neutralization is used. The alkali is poured rapidly into the tube and well mixed, and the tube centrifuged for not more than five minutes, at not more than one thousand to fifteen hundred revolutions per minute. After centrifugation the supernatant fluid should be poured off and the sediment suspended in Locke's solution and washed with it once or twice at a low speed of the centrifuge.

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Insulin Treatment.—Irvine H. Page (*Journal of Laboratory and Clinical Medicine,* July, 1923) used the Benedict-Osterberg normal urine sugar method for his determinations. Samples of urine were collected hourly from 7 a. m. to 7 p. m., and the combined twelve hour night specimen was saved. The results on the normal persons indicate, on a statistical basis, that the curve of normal sugar excretion is remarkably constant, but with a slight upward trend from morning to evening, with a low level during sleep; considered on the basis of hourly samples, the quantity of sugar excreted rises for one hour after meals, then sharply falls (the original on a lower level). The rise in no way depends on the quantity or quality of food ingested. In general the greatest rise follows breakfast; the curve of the socalled normal cases does not go above the 90 to 110 mg. level. Great variations and remarkable constancies of sugar excretion may occur at different times in the same person. In the borderline and suspected diabetics there was a remarkable ability to maintain a sugar free urine except two to four hours a day. These socalled breaks usually occurred one and one-half hours or longer after meals and may last for one to two hours. The author believes that the ability to detect latent, borderline or mild diabetics depends on the determination of the picture of hourly sugar secretion, under the varying conditions of the patient's life. He thinks the test described is superior to the glucose tolerance test, as on one hand it detects abnormally high sugar wastage, and on the other warns of dangerously low sugar secretion, hence offers an ideal method for the control of cases under insulin treatment.

Treatment of Tuberculosis.—Robert Philip (*British Medical Journal,* March 24, 1923) believes in the superiority of the percutaneous over the subcutaneous method of administering tuberculin. He found that tuberculin is freely absorbed when it is rubbed firmly into the skin and that it exerts a specific influence on tuberculous processes throughout the body. The therapeutic effect is noticed very soon. The other advantages of this method of administration are the absence of pain and discomfort, the procedure is not dreaded, especially by children, and it is, to a certain extent, a gauge of the susceptibility of the patient, which in turn determines the amount and frequency of the dosage. The therapeutic effect on superficial tuberculous lesions (cutaneous, glandular, etc.) becomes apparent within a few weeks and is usually continuous. The author favors this form of treatment as early as possible in the chronic glandular enlargements in children, thereby favoring the prevention of deeper involvement. The actual amount of tuberculin, if it is used in twenty-five per cent. dilution, is about 0.1 c. c. in an ointment base, which is rubbed in a sterilized area of skin measuring about one or two square inches.

Treatment of Syphilis.—Nicolas V. Greco (*La Semana Medica,* August 2, 1923) summarizes his article as follows: 1. Zinc has proved efficient in all three stages of syphilis in clearing up subjective symptoms. 2. In the primary stage there was noted lessening of infiltration of the chancre and reduction of glandular swelling. 3. In the secondary stage it caused a disappearance of the rash, but had no effect on mucous patches, in fact seemed to favor their appearance. 4. In tertiary lues it cleared up cutaneous gummata and periostitis. 5. Zinc exercises a tonic reconstructive action on the system. 6. Zinc may be combined with mercury in any case where iodides are indicated. 7. The dose is about that of the corresponding mercurial salts and the toxicity is not a factor in the medicinal dose.

Treatment of Pneumonia.—H. T. Nippert (*Minnesota Medicine,* September, 1923) believes in the isolation of the patient, the disinfection of linen and secretions. Ether pneumonia may be reduced by shortening the duration of the anesthetic and by substituting local anesthesia where possible, particularly where patients have colds, diseased tonsils or infected sinuses. United States Public Health Service reports show very little benefit from prophylactic vaccination. The patient should be kept warm and comfortable and not allowed to become chilled. An initial dose of calomel followed by magnesium citrate is advisable; plenty of water is indicated, especially if the toxemia is progressive; to the water may be added the acetate, bicarbonate and citrate of potassium to increase diuresis. An entero- and hypodermoclysis of normal saline solution or the intravenous injection of 250 c. c. of ten per cent. solution of glucose will assist elimination. Alcohol is valuable. Venesection in the plethoric, eight to sixteen ounces, will often relieve dyspnea. Fever as a rule will take care of itself; pain must be relieved by opiates; quinine fifteen to twenty grains as an antipyretic is referable to depressing coal tar products. Edema of the lungs calls for venesection in suitable cases, or the use of atropin or oxygen. The patient should be kept in bed at least a week after his crisis. X ray examination is of service especially in localizing an empyema or a lung abscess. As to blood pressure, Gibson's rule that when the pulse rate per minute is higher than the blood pressure in m. m. of mercury the prognosis is less favorable.

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Treatment of Pyelitis by Ureteral Catheterization and Instillation of the Kidney Pelvis

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Until a comparatively few years ago pyelitis was rarely diagnosed as such. Many chronic cases were diagnosed as appendicitis and entirely needless operations were done, naturally without relief. Acute cases were diagnosed as various acute inflammations of the kidney proper, of the intestine, or the appendix, and the real nature of the infection was entirely unsuspected. Now, however, with our knowledge of the disease, mistaken diagnoses are uncommon and usually the result of carelessness and lack of study of the patient.

INFECTING AGENT.

The bacteria causing the infection may be any of the pathogenic bacteria, but the vast majority of cases are due to a bacillus of the colon group, either the colon bacillus itself or its very close relative, the Bacillus aerogenes mycosum. Those due to other bacteria are so rare as to be practically negligible, and need hardly be considered.

SYMPTOMATOLOGY.

Symptoms of the attack in the acute cases are: fever; relatively high leucocyte count, often over 25,000 and with a high percentage of polymorphonuclears; pyuria, usually to the extent of cloudy urine, though not always; and pain in the lumbar region on the affected side. The right side is much more commonly affected than the left, especially in pregnancy (when the pressure of the pregnant uterus on the ureter at the pelvic brim is a predisposing cause), but the left side is quite often involved, and at times the infection is bilateral.

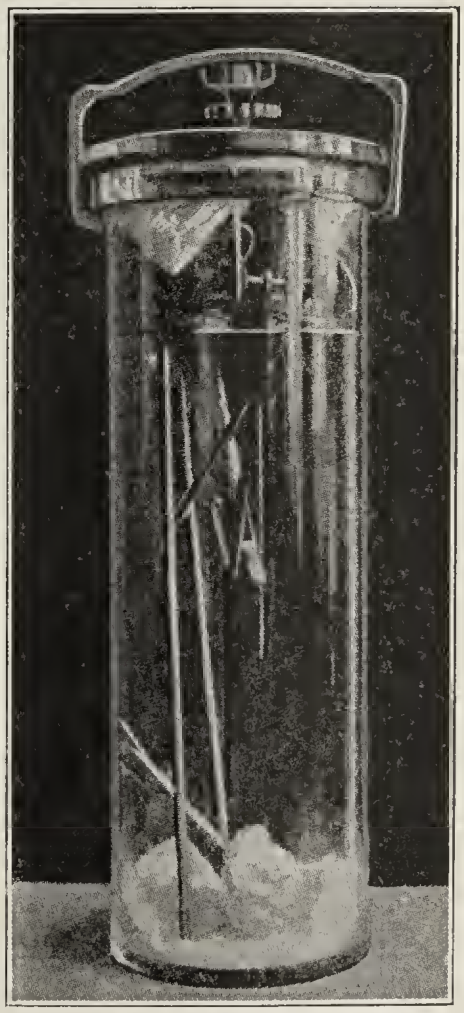

FIG. 1.—Sterilizing plant for cystoscopes and catheters. Loose formaldehyde powder in bottom of jar. Efficient and inexpensive.

The chronic cases are due either to the persistence of an acute infection, or else begin with an infection so mild as to be free from the symptoms of the acute attack, and run a chronic course from the very outset. Occasionally, the acute attack closely simulates an acute intraabdominal infection, and for the first twenty-four hours the differential diagnosis may be a matter of extreme difficulty.

POINTS OF PAIN.

Pain in the affected lumbar region is a constant symptom in the acute cases, but a variable one in the chronic. It is a constant, dull ache, with exacerbations of quite acute pain, and is always intensified by bimanual pressure. The second point of tenderness is where the ureter crosses the pelvic brim, and this is often quite acute under pressure. It is this point that is responsible for the multitude of mistaken diagnoses of appendicitis, as the site of the ureter crossing the brim is almost directly under the appendix. It would not be going too far to insist that no woman should be operated upon for chronic appendicitis until she has been cystoscoped and pyelitis excluded. The third point of tenderness, often overlooked, is where the ureter enters the bladder. This is usually elicited by vaginal palpation only and is not a subjective symptom. In cases of long standing the ureter can often be felt like an indurated cord, through the vaginal vault, though in such a case tuberculosis is to be suspected.

The true diagnosis is usually easily established by the above mentioned symptoms alone. In any case

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of doubt, the patient should be cystoscoped, and the triangular area of erosion, with its point at the ureteral mouth and its base in the trigone, can easily be seen. In addition, a few minutes' watching will show the ureter spouting cloudy urine. In any case where actual thick pus is seen slowly to exude from the ureter, tuberculosis is to be suspected. In ordinary pyelitis the urine is simply cloudy, or at times even milky in appearance.

TREATMENT.

The palliative treatment of pyelitis is usually a waste of time. Rest in bed; milk diet; plenty of water; bladder irrigation with boracic acid solution to increase ureteral peristalsis and hence drainage; ice bag to the affected lumbar region; urotropin or other urinary antiseptics, practically exhaust the means at our command. I much doubt whether they have any influence at all on the course of the infection, and believe that, with the usual tendency of human ailments to selflimitation, the case would pass into the subacute or chronic stage as quickly if no treatment other than rest in bed were instituted. At the most optimistic outlook, palliative treatment cannot cure the infection, but merely bridges over an interval, often days long, until the patient establishes her own immunity or antitoxin, if the term can be used in this connection. I have long since discarded the palliative treatment and would advise it only where lack of the necessary instruments or training in their use prevents carrying out the rapidly effective active lavage and instillation.

ACTIVE TREATMENT.

This consists of catheterization of the ureter and instillation into the pelvis of the kidney of eight to fifteen c. c. of a solution of silver salts, which will be described below.

Of the two methods of cystoscopy, involving distention of the bladder with air or water, the water distention is in much more common use, and much to be preferred. It can be done, in chronic cases, as a routine office procedure, without difficulty or pain, and involves no such uncomfortable position of the patient as is needed in the air distention method. In addition, proficiency in its use is infinitely easier to acquire. A short description of the technic I have found thoroughly satisfactory and least troublesome may prove of value.

1. The patient is placed in the ordinary dorsal position, as for any other vaginal examination.

2. A four ounce metal funnel (glass cracks too easily in boiling), to which is attached a fairly large calibre rubber catheter, is prepared by boiling (Fig. 2).

3. This catheter is anointed with a solution of ten per cent. cocaine in glycerin, acting not only as a lubricant but as a local anesthetic.

4. The catheter is inserted into the bladder, after proper preliminary cleansing of the vestibule and urethral orifice. Any urine in the bladder is drained off.

5. The bladder is filled with cold sterile water, to the point of tolerance of the patient. She should be impressed with the need for cooperation on this point. The commonest points of difficulty are too little water in the bladder and too dim a light on the cystoscope. The reason for cold water in the bladder is to minimize softening of the ureteral catheters to be used and making their introduction easier.

6. The cystoscope, with catheters in their channels, is inserted and the light turned on. The ureters are usually easily found by turning the cystoscope, with the lens facing the trigone, at an angle of 45° to the middle line.

7. If the ureteral orifice cannot be found, the difficulty can easily be overcome by injecting intravenously two c. c. of indigocarmine solution. This procedure is entirely harmless, and in two and a half minutes blue urine will spout from the ureters, as against twelve to fifteen minutes when it is injected intramuscularly. This makes the ureteral orifice easily seen, and it can then be catheterized. With moderate practice, however, this method is rarely needed.

8. The infected ureter is catheterized and the catheter pushed in as far as possible, up to the kidney pelvis. If difficulty is experienced in getting the catheter to travel up the ureter, it can often be overcome by rolling the catheter in the fingers, at the same time pushing it upward. Frequently smaller sizes must be tried before the kidney pelvis can be reached.

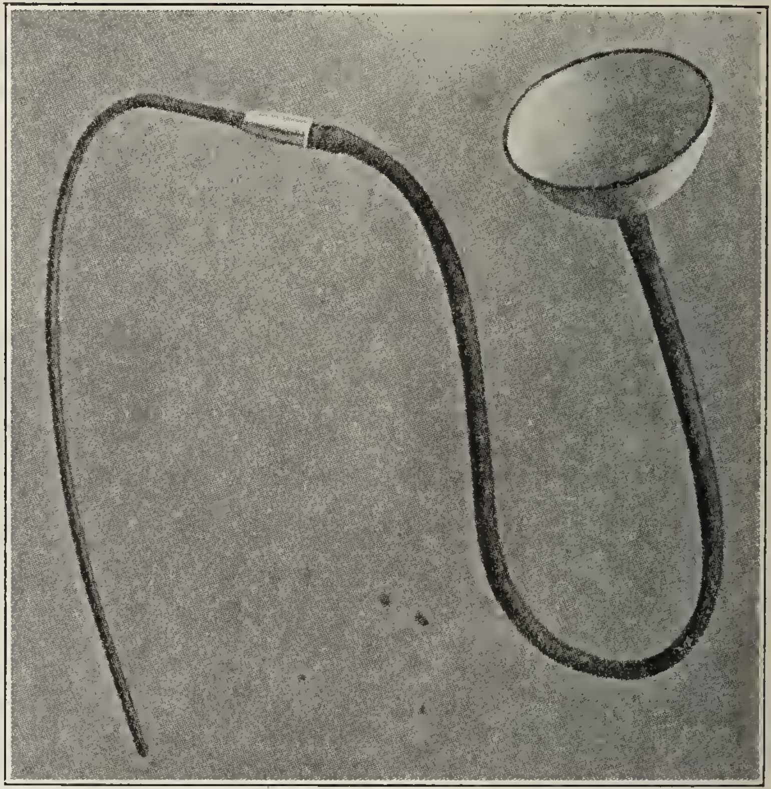

FIG. 2.—Apparatus for irrigation of the bladder, consisting of a catheter, glass connection, rubber tube and a metal four ounce funnel. A glass funnel is too likely to crack in boiling.

9. Through the catheter eight to fifteen c. c. of silvol or neosilvol solution, ten per cent., are injected slowly and without force. This is the capacity of the average kidney pelvis. Preliminary irrigation of the pelvis of the kidney with boric acid solution is unnecessary and a waste of time. Should the patient complain of any pain in the back, the injection must be stopped at once. This symptom should always be inquired for, and no attempt ever made to inject the solution forcibly.

10. When the desired amount has been injected the cystoscope and catheter are withdrawn together and the water in the bladder either withdrawn by a catheter or by voluntary expulsion.

No general anesthetic is needed, even in nervous patients. Occasionally the urethral orifice is too small to admit the cystoscope, and must be dilated, st by metal sounds. This can be done practically inlessly, under the local anesthesia of the cocaine lution. The same solution is used as a lubricant the sounds and cystoscope.

There is ordinarily no afterreaction of any kind, that the method can, in chronic cases, be used as outine method of office treatment. In acute cases, th fever and high leucocyte count, the patients are, course, not ambulatory and the irrigations can be rried out either at their homes or in hospital, as y are confined to bed. Rarely, there is acute pain nulating stone in the ureter, of short duration. is is probably due to a small blood clot, caused by passage of the catheter, which at times, by its int, inflicts slight trauma to the ureteral walls.

At times the urine is so cloudy that it is difficult get a satisfactory view of the bladder walls and eteral orifice. In such cases, if the bladder is reatedly filled with sterile water and immediately iptied, a clear field of vision can be obtained after ly a few minutes of this irrigation. It is obvious, course, that if the ureter appears healthy and bladder infected no attempt at catheterization ould be made.

SOLUTIONS USED.

After a trial of many different antiseptic solutions, er a period of a good many years, I am now using per cent. or fifteen per cent. solution of silvol neosilvol in all this work. Silvol makes a dark own solution, staining deeply anything with which comes in contact. Neosilvol makes a milky, yelvish solution and is free from this objectionable ining. I have repeatedly used the fifteen per cent. ution of either one in the pelvis of the kidney, thout evidence of pain or secondary irritation. I itinely employ the ten per cent., however, reving the stronger solution for obstinate cases. It better for the solution to be freshly prepared, ough it will keep for several weeks without eviice of deterioration. My own plan is to renew solution every week, and have prepared only ough to meet my average requirements for that ie. It can easily and quickly be prepared, howr, should more be needed. These two solutions ve given and are giving me better results than I ve been able to obtain with any other, and I have ind them most satisfactory.

RESULTS TO BE EXPECTED.

In acute cases, the rule is an immediate marked provement. The temperature falls, leucocyte int drops, and the patient is immediately more nfortable. Not infrequently one irrigation is all t is needed, but as a rule the treatment must be eated three or four times, at twenty-four or forty-ht hour intervals, governed by the urgency of the nptoms. It is rare indeed for a patient with iple pyelitis to need more than three or four intions all told, and recurrence at a later date is y rare. A case of stone in the pelvis or of tuberosis is of course a different matter, but these are the subject of discussion here. The urine clears promptly, pus disappears, all symptoms subside l the patient is rapidly well. Even in the cases ere one injection seems to be enough to clear up symptoms, I have learned that it is wiser to ret it once or twice to avoid recurrences. To anywho has tried both the palliative and active forms of treatment, the value of the active has been demonstrated beyond all discussion.

PYELITIS IN PREGNANCY.

In pregnancy pyelitis is nearly always acute, or the acute exacerbation of an old chronic attack. It often presents an alarming picture, with high fever, high leucocyte count and milky urine loaded with pus cells. The later in pregnancy the more acute and serious the attack, though the commonest time is from the fourth to the sixth month. It is in these cases, however, that instillation of the pelvis of the kidney gives the most rapid and brilliant results. It is common to see a patient with a temperature of 103° or over, leucocytes 25,000, one or more chills and giving every evidence of severe infection, in whom, after one injection of fifteen per cent. silvol or neosilvol into the pelvis of the kidney, all symptoms will subside, and within twelve hours the patient will be comfortable and apparently well. It is advisable to give two or three more injections, however, to avoid a later recurrence. It is entirely unnecessary to induce labor or otherwise terminate pregnancy in these cases. They are not well equipped at the moment to stand the strain of labor or surgical interference and it is a great mistake to subject them to it. Anyone who has seen the astonishing change produced in these cases by the simple instillation of the kidney of the pelvis would never consider any other form of treatment.

There is a difficulty to be met in these cases, however, that does not exist in the nonpregnant patient, and the later in pregnancy the more pronounced is the difficulty. The trigone of the bladder is greatly congested and the ureteral openings much less plainly visible than in the nonpregnant patient. In the later months the child's head causes a bulge of the bladder in the midline, so that there is a pouch on either side, on the sloping side of which is the ureteral orifice. If an extra amount of water is put in the bladder, and, with the patient in the dorsal position, the foot of the table is raised somewhat, much of the difficulty will disappear, though the process is never as easy as when not complicated by pregnancy.

PYELITIS IN CHILDREN.

This condition is fortunately rare, though cystitis is very common. Should it develop, however, it is perfectly practicable to catheterize the ureter of any female child over eighteen months of age. A specially small, single channelled cystoscope has to be used, and often general anesthesia, as the child is sure to be unruly. The same solution of silvol or neosilvol may be used, though I never use over ten per cent. in children, and the total quantity injected varies from two to five c. c. which is practically sure to fill the pelvis of the kidney.

In these children it is rare to have to repeat the instillation, and it is also inadvisable, because of the need for repeated anesthesia.

INSTRUMENTS REQUIRED.

For many years I struggled along with the usual type of lens cystoscope, with a very limited field in the catheterizing scope. Some years ago, however, a cystoscope of 24 F. calibre was designed by Dr. B. C. Hirst, of Philadelphia, with a wide angle lens and a high power tungsten film lamp. This is known as the Brown-Buerger special and is incomparably superior to the older cystoscopes. The field is large enough to show both ureters at once, and it enormously simplifies the task of catheterizing, besides using the same lens for both simple examinations and catheterization.

Sterilization may be effective in several ways. A metal sterilizer with a lamp vaporizing formalin pastilles is very effective, but has several disadvantages. It is undeniably effective, but the hot vapor softens the catheters and it is difficult to insert them, as they become very limber, and the lamp is forever going out just when it is most inconvenient.

All cystoscopes are now made with watertight lenses at both ends, and therefore cystoscopes, catheters and all appliances can be soaked for an hour or more in a one per cent. formalin solution without injury to them and with assurance of sterility. This solution must be thoroughly rinsed off with sterile water before use, as it is most irritating to the bladder and urethra and also to the operator's eyes, on looking through the eye piece lens.

A satisfactory sterilizer is the one shown in Fig. 1. It is an ordinary pathological specimen jar with a rack for holding the instruments. A thick layer of formaldehyde powder is in the bottom. All instruments and catheters are put in it, and the top screwed on. It serves both as sterilizer and transporting case, and the instruments are kept always ready for use. It has the slight disadvantage of tarnishing the nickel plating of the instrument but does not affect the lenses at all. This tarnishing affects the appearance of the instruments, but does not in the least affect their optical qualities. This small disadvantage is more than offset by the greater advantage of ease of transportation, protection and constant sterility.

After use the instruments must be thoroughly dried; the catheters being cleaned and dried by forcing them first through sterile water, then ninety-five per cent. alcohol, and then ether. They can be kept in good condition only by keeping stylets constantly in them, for their entire length, when not in use. At best their life is short and when once they become rough or limp should be discarded. The stylet should be of German silver, as the ordinary wire one will rust and rapidly spoil the catheters.

1823 Pine Street.

The Surgical Treatment of Puerperal Infection

By HENRY B. SAFFORD, A.B., M.D., F.A.C.S.,
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There has been great advancement in surgical technic, methods, and systems during the last decade. Methods of precision in relation to asepsis and antisepsis have opened up remarkable possibilities in certain surgical branches. The two notable fields in which lack of progress has been significant are the surgical treatment of cancer and of the infections that still so frequently develop in connection with abortion and confinement.

Statistics of death rates compiled from many sources show that puerperal mortality in this country reaches an annual total of about twenty thousand deaths, at least half of which are due to some form of infection. If these figures represent the mortality rate, it does not require a vivid imagination to compute the enormous number of infected cases from which the statistics were compiled.

The student cannot fail to be impressed by the generally unsatisfactory nature of much of the treatment suggested for puerperal infection, as well as the wide divergence of opinion upon the subject. Thus, one surgeon would subject every patient with a postpartum temperature to a curettage, while another declares this treatment to be pernicious. If a census were taken, it is probable that it would be found about equally divided between those who curette and those who do not.

It is obvious that the habit of universal curettage is not completely satisfactory. In fact, its use rests upon the uncertain and incorrect assumption that there is retained placental material in every case of abortion or confinement in which there is an elevation of temperature. Moreover, it is impossible to scrape the interior of a large uterus entirely clean by the ordinary curettage methods, which are like one clumsily groping in the dark. And if this process does result in the removal of a certain amount of disintegrating material, it is also certain to remove much protective endometrium, open up lymphatic and venous channels, destroy Nature's leucocytic wall and frequently produce a troublesome and alarming hemorrhage, which still further depletes the vitality of the patient at a time when she is most needful of all her powers of resistance. More than this, it is a well known fact that the mortality rate in cases treated in this manner is discouragingly high.

The expectant treatment is quite as unsatisfactory; summed up, it is no treatment at all. The fact that there may be a mass of festering organic material within the uterine cavity is ignored. It is left to rot out, and it will rot out in the course of time, if the patient lives long enough. The patient is allowed supportive treatment while the rotting process takes place. The only surgical principle involved in this system is that of gravity drainage, effected by a modified Fowler posture. The surgical fundamental of safeguarding drainage of cavities from the bottom is neglected. Anyone who has been obliged to watch a patient struggle for weeks and even months under the socalled expectant treatment can feel that the length of the fight might perhaps have been satisfactorily curtailed had some more efficient measure been adopted from the beginning. It would be difficult to prove that the mortality rate with this method of treatment differs materially from that of universal curettage.

The entire field of obstetrical surgery presents a r more difficult problem in reference to asepsis than es almost any other branch of surgery. Not only ust we deal frequently with an unsterile field, but so one in which the resistance has been weakened by olonged traumatism and which, in most forms of fection, does not possess a barrier of the poten- ility of the peritoneum.

ICROORGANISMS CAUSING PUERPERAL INFECTION.

The principal microorganisms which have been own to be responsible for puerperal infection are e streptococcus, the staphylococcus, the gonococcus d the colon bacillus. There are lesser micro- ganisms giving rise to a lower grade of infection, ch as the socalled sapremia. It should be remem- red that some of these bacteria are doubtless being troduced frequently into the vaginal canal of the egnant woman from a number of sources, and e know that they do not immediately become nocuous. In a recent bacteriological examination vaginal secretions from antepartum cases, two owed the presence of the colon bacillus and from anatomical viewpoint it is remarkable that this cillus is not universally present. It can be demon- rated that many vaginal cultures show the presence gram positive microorganisms, both bacilli and cci. Doubtless many of these are nonpathogenic. very vaginal examination, therefore, possesses the nger of carrying infection from the interior, as ell as exterior, higher up into the birth canal to creasingly fertile culture media.

The perfectly normal puerperium should be table for the complete absence of any constitutional mptoms whatever, a rise of temperature usually ing the first sign of trouble. Any case in which e temperature exceeds 100° on any two consecutive daily readings during the first week following de- very should be considered one of puerperal fever d its source carefully sought. The morbidity rate, measured in these terms, will be found high. very physician has frequent cases where there will present a mild fever for two or three days with other constitutional symptoms, the temperature ortly subsiding to normal and the source of the ouble never being accurately determined. On the her hand, when upon the third or fourth day stpartum there is a chill, followed by high eleva- on of temperature and disproportionate pulse rate, situation has presented itself so fraught with dan- r that most energetic measures must be taken.

LOCATION OF FOCUS OF INFECTION.

There are two factors preeminent in the handling a case of puerperal infection—promptness of tion and an accurate diagnosis of the location of e initial focus of the infective process. Both these ctors are difficult to cultivate. Many doctors are luctant to admit, particularly if they happen to ve been the responsible parties in the case from inception, that they have to deal with a case of fection. It is easier to temporize. Other possible planations to account for the symptoms that are coming so alarming present themselves. It may attributed to lactation, constipation, nervousness, alaria, too many visitors, or any other triviality.

It should be possible to eliminate promptly any these possibilities and it seems unnecessary here emphasize the danger of allowing oneself to be ng deluded by one of them. If it can be demonstrated that the cause is outside the generative tract, so much the better, but the burden of proof should rest upon the physician. The proper procedure is to look the proposition squarely in the face that in all probability one has to deal with a case of infection, and then act accordingly, with courage and promptness.

The location of the focus of infection is by no means always easy to discover. It will eventually nearly always manifest itself in some definite lesion along the genital tract. There is, however, one class of primary blood infections which must be differentiated in puerperal cases, as such processes are often blindly treated and a successful outcome depends upon the early discovery of the initial focus. The source of these will be found outside the generative tract in such locations as the teeth, tonsils, breast, gallbladder, liver, pancreas, intestinal tract and the urinary tract, the last named beyond doubt being the most common. In fact, it would appear strange that a larger proportion of these infections do not ascend the urinary branch of the genitourinary system.

The factors limiting infection by the kidney route are, the more circumscribed anatomy of the urinary system, a certain immunity that has been acquired from the proximity of the colon, and the irrigating process of Nature. The symptoms are in many respects similar to those of infection of the internal organs of generation and, should the process develop subsequent to confinement, the diagnosis may be temporarily clouded. When a patient has a chill at about the fourth day following her delivery, together with a sudden elevation of temperature and pulse rate, it becomes highly important to decide at the earliest possible moment whether the infection is of the genital organs or of the urinary system; for if the former, suitable treatment at the earliest possible moment is essential. It is quite certain that patients showing elevation of temperature following childbirth have been rushed to the operating room and curetted, when the lesion itself was in the kidney.

Having eliminated extrinsic foci of infection, a primary focus connected with the genital tract will nearly always manifest itself by some definite lesion along one of four areas, classified as follows:

1. Infection of the perineum.
2. Infection of the cervix.
3. Infection of retained secundines.
4. Infection of the interior of the uterus.

Some of these infections will remain localized and some will spread to other areas very quickly. It is the purpose of prompt and forceful treatment to destroy, or at least to modify the virulence of the infection at its primary focus, before it has invaded adjacent areas and perhaps become a systemic condition which will end fatally.

INFECTIONS OF THE PERINEUM.

Infections of the perineum, as well as of other vaginal tracts, occur, first, in areas which have not been repaired, but have been left open; second, upon the site of a primary perineorrhaphy. It is hardly necessary here to emphasize the importance of a careful examination of the vaginal canal after delivery, with a well adjudged repair of any injuries noted. Tears are of frequent occurrence in other parts of the vaginal canal than the centre of the perineum. The honesty or acumen of the man who never gets a tear are under suspicion. It is certainly an unsurgical procedure to leave a raw, bleeding surface open to invite infection.

Infections following repair are augmented, not only by the fact that one must deal with severely traumatized tissues, but also by the common temptation to draw sutures too tight, thus interfering with the normal nutrition of the part.

Infections of a laceration, whether open or repaired, present practically the same symptoms of toxic absorption. The treatment is the same and aims at checking the spread of the infection while destroying its focus. All sutures must be removed and the torn surfaces should be kept from contact with each other by wet, strongly antiseptic gauze packs, which should be changed frequently. The patient should be put into the exaggerated Fowler posture. Such treatment will nearly always produce quick results if inaugurated promptly after the discovery of the lesion.

INFECTIONS OF THE CERVIX.

These are most serious. The lymphatic supply of the cervix is such that in a neglected cervical tear we have a tremendous port of entry for infection directly to the important lymph channels. For this reason infections of the cervix rarely remain localized, but when discovered are giving rise to such pyramiding types of infection as lymphatic septicemia, where the outcome will be serious.

There seems to be no good reason why these cervical tears should be neglected, particularly in those cases which are handled under proper surgical conditions. Examination of a large number of women after delivery seems to warrant the statement that in practically all primiparæ the cervices are lacerated to a greater or less degree. It is quite true that in a large percentage of these cases the laceration is comparatively slight and may even be undiscoverable immediately after delivery owing to the traumatism to which the tissues have been subjected. On the other hand, in many cases the cervix is widely lacerated, frequently even to the vaginal vault, and it is a fact that rarely are such lacerations even sought for, except in the event of hemorrhage, which drives the obstetrician to an investigation. Good surgery certainly points to the repair of extensive injuries when they occur in any part of the body, thus closing certain patent channels for infection.

INFECTION OF RETAINED SECUNDINES.

It is obvious that fragments of secundines frequently remain in the uterus without the knowledge of the physician. The classical routine examination of the placenta and membranes after the third stage of labor is often treacherous, in that it inspires the examiner with a false confidence.

This class of infection and that covering involvement of the interior of the uterus constitute a very large proportion of the cases of puerperal fever. There is no question that the process is likely to extend from retained placental material to the uterine interior itself. We come now to the proposition of curettage. Shall we curette in all cases with an excessive elevation of temperature, when the uterus is large, soft and sensitive, or shall we leave all such cases religiously alone, waiting for the disintegrating material, when present, to rot out?

It appears unsafe and unscientific to formulate a comprehensive rule for this entire class of cases. It should be possible to differentiate between those in which the uterine cavity contains disintegrating material and those in which it does not. There are two symptoms which commonly occur in the former type of cases, hemorrhage and contractions resulting from the efforts of the uterus to expel its contents. In addition, there is a sure means of investigation by palpation of the interior of the uterine cavity. This may be accomplished with accuracy under a general anesthetic. The ordinary bimanual examination with two fingers will not suffice. The entire hand must be introduced within the vaginal canal, the two examining fingers penetrating the cervix; then, with firm pressure of the external hand upon the fundus the large, soft, open uterus can be sufficiently inverted to allow the palpating fingers to explore all parts of its cavity. Foreign material should be removed by these fingers augmented by sponge, forceps, and not by a sharp curette, for the curette is a blundering instrument which causes new, open wounds of the uterine mucosa, making patent new channels for extension of infection from the already involved secudines. It is certain that if retained material is so firmly adherent to the uterine interior as to preclude its removal by the method described, further attempts through the medium of a sharp curette can only result in extensive excavation of the uterine wall itself.

INFECTION OF THE INTERIOR OF THE UTERUS.

This usually takes place at the placental site. When in a case presenting a large, sensitive, improperly involuting uterus, the uterine cavity has been demonstrated, in the manner just described, to be clear, there probably exists a septic endometritis or metritis, or both. It has been taught upon good authority that there is at present no means of treating primary infection in the uterus which does not at the same time favor extension of the inflammatory process to the surrounding tissues or to the blood stream. It is also argued that local treatment in this class of cases comes too late, as the infection has already penetrated beyond its original focus and is rife as a systemic infection. It is doubtful if these arguments can be sustained by any array of facts and figures.

Carrel demonstrated several years ago what could be accomplished in the treatment of infections by the frequent scientific application of a powerful antiseptic solution. Utilizing the surgical principle involved in his methods, tubes adapted to the proper dissemination of a germicidal solution may be introduced into the uterine cavity. It is best to use two tubes, one long enough to reach nearly to the top of the cavity, the other much shorter. The best solution is undoubtedly some form of hypochlorite of soda and the irrigations should be made at regular two hour intervals, either by means of a fixed irrigation apparatus or by a small hand syringe. The tubes should be of the diameter of the finger and are firmly fastened in place by means of a deep suture transfixing the tubes and the cervix itself.

Intubation by this method not only accomplishes he direct application of a powerful antiseptic rectly to the primary infective focus, but it prodes all the mechanical principles of proper drainge. Experience with a series of cases leads us to he conclusion that here is a valuable method of andling a condition for which no other means of eatment has proved satisfactory. Prompt inauuration of the treatment is of prime importance, as fter the fifth day postpartum, efficiency decreases t the rate of thirty-five per cent. a day. Late eatment in this manner is worthless.

The primary infection may remain localized in any f the areas noted above, or it may spread in many irections. This scattering of the infection takes ace in one of three ways: 1. By the endometrium, iving rise successively in its progress to salpinitis, ovaritis, pelvic abscess, and peritonitis. 2. By he lymphatics, directly through the wall of the terus, giving rise to pelvic cellulitis and septicemia. . By the blood stream, commencing at the placental te and spreading through the blood sinuses, giving se to thrombophlebitis, pyemia and septicemia.

In considering the lesions due to spread of the nfective process one significant fact presents itself. Of all the microorganisms the gonococcus is the nly one that appears to follow mucous membrane ssue. However, the gonococcus is not a particularly ommon factor in the development of puerperal nfection; hence it follows that pus tubes are by no means common sequelæ.

SALPINGITIS.

This is due primarily to extension along the tube rom the infected uterus. It is quite possible, however, that it may be the lighting up of an old process, resumably gonococcic. Abdominal pain is the preominating symptom in these cases and the involvement usually extends to the ovary and quite often o the peritoneum. Determination of the proper line f treatment for this class of cases calls for great icety of judgment. Pyosalpinx caused by an old onococcic infection is operated upon to best advanage after an extensive interval of rest, for the abdomen not only will have built up for itself a high degree of immunity, but a very effective diminution f the virility of this particular, microorganism has by this time been accomplished. It is safe to wait, if the patient is where she can be under observation.

On the other hand, when a pus tube, believed to be of puerperal origin, has been diagnosed to a reaonable certainty, its removal is indicated, for as ong as it remains, there is present a certain amount f danger to the patient from a further involvement f the peritoneum, due to leakage or rupture, or rom a metastatic complication. If not operated pon, there will be persistent fever and pain, with tle likelihood of any tendency to resolution.

OVARITIS.

There are two ways in which ovaritis may develop: By extension of infection from a tube, the ovary nd tube usually being found involved in a common ass. 2. By extension of infection directly from he uterus by means of the lymphatic channels, specially along the course of the ovarian ligament. his condition may become quiescent or may deelop into any one of the following conditions:

OVARIAN ABSCESS.

Postpartum ovarian abscesses of considerable size have been reported. The majority are small. The symptoms which they precipitate are similar to those of pyosalpinx and the treatment consists in removal. The leading factor in establishing the diagnosis will prove to be the history. Depending upon the mode of development, as indicated above, the operative findings will prove to be one of two classes: 1. A salpingoovaritis, with pus tube and purulent ovary bound together with a mass of adhesions which usually involve still others of the adjacent viscera. 2. An isolated abscess of the ovary with both tubes entirely normal, thus proving the course of the infection to have been by the lymphatic route.

PELVIC ABSCESS.

Pelvic abscess is usually the result of a leaking tube. In this condition there is frequently a combination of salpingitis, ovaritis and peritonitis, and if streptococcic in origin, the result may be most serious. Treatment by posterior colpotomy is indicated, as a transperitoneal operation, through dissemination of the peritoneal infection, is likely to prove fatal.

PELVIC CELLULITIS.

This is a lymphangitis of the connective tissue about the uterus, due to the streptococcus, staphylococcus or colon bacillus. The treatment consists in watchful waiting. The result will be—resolution or the development of a broad ligament abscess.

BROAD LIGAMENT ABSCESS.

Abscesses of the broad ligament may occur as the result of pelvic cellulitis or of the breaking down of septic thrombi. In this condition fluctuation will appear in about two weeks after the initial infection. There can be no question of the advisability of opening a parametric abscess as soon as pus is suspected. Sometimes after such treatment only a few drops of seropurulent fluid will be obtained, but this will be sufficient to clear up the condition. There is grave danger, however, in approaching a broad ligament abscess by the intraabdominal route, for the disturbance of a streptococcic infection is likely to result in fatal peritonitis.

It is possible to drain an abscess of this type from below. The dangers in this operation are: 1. Those arising from an inaccurate diagnosis of the exact location of the inflammatory process. 2. Those arising from the peculiar anatomy of the structures. The rectum, bladder, uterus, uterine vessels and the ureters may be irreparably damaged by an illadvised procedure in this region.

Broad ligament abscesses are demonstrably best treated by extraperitoneal drainage. In this operation, the principles of which were first suggested by Roberts, approach is made to the affected broad ligament by a small incision just over the internal abdominal ring. The aponeurosis of the external oblique is split, the round ligament demonstrated and followed into the space between the layers of the broad ligament. Upon the appearance of pus drainage is installed. This operation may be performed in connection with a median exploratory incision. A small series of cases has demonstrated the excellence of the results obtainable from this maneuvre.

SEPTIC THROMBOSIS.

The infection of thrombi filling the uterine sinuses after labor results in septic thrombosis. If the process remains limited to accessible veins, it may be possible to block its further progress by means of ligation. Sufficient data are not available upon this point.

PERITONITIS.

This condition is serious always and the treatment of the puerperal variety does not differ from the routine treatment of that due to any other cause. Rest, posture, and encouragement of elimination, together with drainage of exudate should localization occur, are the main factors. The final result, if fatal, is usually due to autointoxication caused by intestinal stasis.

SEPTICEMIA AND PYEMIA.

These conditions are manifestations of those infections disseminated by the blood stream. They are obviously most serious but are by no means universally fatal. The treatment is more of a medicinal than a surgical nature, aiming at raising the resistance of the patient. Serum or vaccine therapy has been reported as of value. Blood transfusion is generally advocated. Transfusion, with the utilization of an immunized donor, is theoretically of still greater value. Personal experience with direct transfusions, repeatedly performed, have been rather unsatisfactory. It must be admitted, however, that these measures were in every case carried out at a late stage of the infective process, when the condition was considered practically hopeless. It is quite possible that more prompt utilization of this measure might produce happier results.

Infections by the lymphatic route give rise to cellulitis and septicemia. The lymphatic type of septicemia is the most serious of all the end results of puerperal infection, as it is likely to be so virulent that it will become disseminated widely, even progressing to a fatal conclusion before any local lesions are evident.

The pathology, symptoms, sequelæ, and treatment of puerperal infection is substantially as has been indicated, whether the situation develops subsequent to a full term delivery, or to an abortion. Early discovery and courageous institution of proper measures of treatment will do much to conquer the most dreaded complication of obstetrical practice.

47 West Ninety-fourth Street.

Chemical Changes in the Toxemia of Pregnancy

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It was Zweifel who called eclampsia "the disease of theories," and looking through the literature on the subject one is impressed with the aptness of this designation. As in other branches of medicine, where too many theories flourish, little is known of facts that actually prevail, and many are tempted to cover with luxuriant verbiage the vast desert of ignorance and speculation.

The causes of toxemia of pregnancy may be classified under the following six headings:

1. Disturbances in fetal metabolism.
2. The entrance of fetal or placental elements into the maternal circulation.
3. Poisoning by substances formed or retained in the placenta.
4. Disturbances of maternal metabolism.
5. Anaphylactic reaction.
6. Mammary toxemia.

Professor Williams, reviewing all these etiological factors, concludes, as everyone must who is cognizant of the subject, that "it is evident that its cause is still undiscovered. All that we know positively is that the disease is accompanied by characteristic lesions in the liver and by striking changes in metabolism."

I shall endeavor to record here the typical chemical changes in toxemia of pregnancy and eclampsia, and, at the risk of burdening the literature with another theory, propound what, in my opinion, is the basic factor in the etiology of these conditions.

The pathological changes or pathochemical disturbances that are present in the toxemia of pregnancy have their initial appearance in the liver structure In all pregnant women there is general abdomina congestion with occasional dysfunction of liver resulting in symptoms, mild at first, and later becoming quite distressing. The Germans have noticed these disturbances in the liver in normal gestation, and they call this liver *Schwangerschaftsleber,* or the liver of pregnancy. These alterations are first a mild congestion with mild degrees of fatty infiltration This may gradually pass to acute yellow atrophy o the liver or to the pathological changes noticed by Ewing in eclampsia.

One becomes convinced more and more that the disturbance in one of the functions of the liver i the fundamental factor in the causation of the toxemia of pregnancy. It must be remembered that o the various functions of the liver its detoxicating influence is one of the most important, and one also to which much attention has been devoted. It is quite well known that toxic radicals liberated during th process of normal or abnormal intestinal digestion are carried to the liver by means of the portal circulation, and there either neutralized or oxidized o conjugated to lessen or remove the toxic influenc of the substance. One of these methods of detoxication is the union of aromatic radicals with sulphuric acid and their excretion in the form of conjugated sulphates (ethereal sulphates) in the urine

Since Städeler found phenol in cows' and horses urine, Landolt, Lieben, Hoppe-Seyler, Buliginsky and Munk found traces of it in normal human urine and Salkowski observed that in ileus and other ob ructive intestinal disease the excretion of phenol the urine was much increased.

This formation of phenol and phenolic substances, resol, indol, skatol, etc., has been ascribed to the ction of intestinal bacterial flora. Such organisms s the Bacillus coli communis, which is a normal inabitant of the intestinal canal, are harmless under rdinary circumstances. In conditions of injury to e intestinal mucosa these organisms become viruent (Fermi and Salto). Other organisms, such as e Bacillus putrificus, the Bacillus aërogenes capulatus, which are obligatory anaërobes, thrive in e colon when there is no oxygen (Herter) and reak up protein into the carbocyclic toxic subtances.

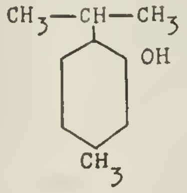
It has been demonstrated by Baumann that these plit products are very toxic, but that when they re united with sulphuric acid they have lost their oisonous effect. Baumann found that phenol sulhate was a normal urinary constituent and that the dministration of phenol increased the elimination f phenol sulphate in the urine. Duncan and Herter eported that not only phenol, but also other subances, were excreted in the urine as conjugated ulphates.

In normal conditions of the alimentary tract trauss and Philipsohn found no phenol in the urine f human beings, and they concluded that under ormal conditions the phenol and other radicals ere conjugated with sulphuric acid. According to ese authors, the liver is the seat of this conjugaon. In hepatic disease there have been observed isturbances in the elimination of the ethereal sulhates. In conditions of jaundice Biernacki found our times as much ethereal sulphates as normally. arenberg and Perroy found an increased excretion f indol and skatol in the urine of jaundiced indiiduals. Labbé and Vitry obtained similar results. agrageas obtained varying amounts of ethereal ulphates in icteric patients.

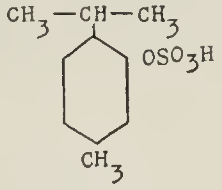
The question has been discussed by Eiger and lopazde whether the aromatic compounds formed the system are diminished in amount and detroyed under normal conditions of hepatic activity, nd whether in cases of disturbances of the function f the liver these compounds are obviously increased nd placed at the disposal of the liver for conjugaon with sulphuric acid. The subject is important its relation to cases of diseases of the hepatic arenchyma, more so than in cases of simple biliary tasis. The ethereal sulphuric acids are most freuently, both absolutely and relatively, increased in trophic cirrhosis of the liver, and most markedly tumors of the liver.

In order to study the detoxicating function of e liver, the following method has been devised. t has seemed to me advisable to administer a definite uantity of an aryl compound and to examine the rine for the conjugated products of this substance. or the purposes of this work thymol seems to be e most suitable aromatic substance to use.

Thymol is metaisopropylcresol. Baumann and erter have found that thymol sulphuric acid occurs the urine of rabbits after thymol administration. ogelius reported that the feeding of 0.5 gram thyol increases the output of ethereal sulphates from .05 gram to 0.107 gram to 100 c. c. of urine. Blum, Preusse, and Finizio have separately reported that thymol is eliminated in the urine as thymol sulphuric acid and as thymol hydroquinone sulphuric acid.



Thymol



Thymol sulphuric acid

I adopted the following technic for the determination of hepatic insufficiency by means of the ethereal sulphate output.

The patient received a dose of castor oil to clean out his bowels. He was then kept on a known diet for two days, during which time the urine was collected, preserved with a few drops of formaldehyde, and analyzed for total sulphur and ethereal sulphates.[1] On the third day the patient received a capsule containing 0.5 gram thymol. A dose of olive oil was administered to the patient several hours after the thymol dose in order to dissolve the thymol and increase its absorption from the intestinal canal. The urine was collected for the next forty-eight hours, preserved with a little formaldehyde and analyzed for total sulphur and the ethereal sulphates.

If all the thymol were absorbed and if all the thymol were conjugated with sulphuric acid and none with glycuronic acid the 0.5 gram thymol would be excreted as 0.7666 gram thymol sulphuric acid. This would cause a marked increase in the percentage of the ethereal sulphates. If the liver were not functionating properly, the thymol would not be conjugated and the percentage of ethereal sulphates would be only slightly different from what it had been on the first two days.

It is possible that each individual cell of the hepatic parenchyma takes part in all of the liver functions; it is probable, however, that different portions of the liver lobule may have specific functions. In the former case it is most likely that reduction in the ability of the liver to perform one function will be accompanied by a proportional reduction in all the liver functions; in the latter case one or more functions of the liver may be disturbed without affecting the other hepatic functions. One objection to the study of the function of any organ as an index of disease of that organ is that it is perhaps possible for the healthy portion of the diseased organ to compensate and assume the work of the whole gland. In such a condition, of course, the functional capacity of the organ may be normal and would be no index of the pathological changes in that organ. Under these circumstances only marked destructive changes would leave their impress on the functional sufficiency of the organ. We have found, however, that by these means it is possible to study the liver function in disease and in pregnancy.

In the beginning of pregnancy there is a disturbance in the detoxicating function of the liver. As normal pregnancy continues, the functional capacity of the liver returns to normal. Should the hepatic structure not be able to return to a state of equilibrium in function the toxic radicals will pass through its structure injuring it more and more, will enter the general circulation, and will affect the other organs of the body, especially the kidneys, so that ultimately a marked pathological disturbance is induced which may result in death due either to intoxication of the primary cause or to the disturbed pathology set up, as, for example, nephritis.

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[1] The total sulphur was analyzed by Benedict's method, and the ethereal sulphates by Folin's method.

INFLUENCE OF DIET ON TOXEMIA OF PREGNANCY.

That the diet has a marked influence in the occurrence of the toxemia of pregnancy is a well known fact. In the great war, when diet played a great rôle in all the functions of life, special studies were made on the influence of diet as an etiological factor in eclampsia. I shall quote Kosmak's excellent summation of this subject:

"Warnekros and other German writers noted reductions in the number of cases of eclampsia in various clinics during this period. Mayer attributed the change to the reduction in the frequency of sexual contact, for he considers the repeated introduction of spermatozoa in the female organisms as a factor in producing anaphylactic processes. But this theory is regarded as farfetched by his German colleagues, who attribute the lessened occurrence of eclampsia to the lowered protein and fat contents of the war diet, which brought about a reduction in the functional hyperactivity of the liver and kidneys so often found in the second half of pregnancy.

"These observations on war diet reduction seem to be in agreement with those made by others in peace times, for it has often been stated that eclampsia is more frequent in northern than in southern countries and that strong, full blooded women are more frequently affected than those who are thin and less well nourished. The geographical differences are attributed to variations in the diet, a greater amount of fat being taken in the northern and more vegetables in the southern latitudes. A French observer, Lafont, has noted that in Algiers the wives of the natives are much less frequently afflicted with eclampsia than the wives of immigrants, which he explains by the fact that the natives eat more vegetables and the immigrants more salty foods. In Turkey eclampsia is stated to occur rarely and in one of the largest lying-in hospitals of Constantinople an average of only two cases has been observed. It has also frequently been affirmed that eclampsia is more frequent during the winter than the summer months, which may be assumed to be due to the influence of the food, as more fat is taken in the colder season than during the warmer period.

"It is to be expected that the clinical picture usually recognized as pregnancy nephritis, which is frequently a forerunner of eclampsia itself, can be favorably influenced through changes in food stuffs. For instance, Warnekros's report from Bumm's clinic in Berlin, shows that the incidence of nephritis during the two war years of 1915 and 1916, was about one per cent. of the total number of labors, while during the four previous years it had varied from two to four per cent. These figures were confirmed by an examination of the statistics of three other obstetrical hospitals in Berlin. The number of eclamptic cases showed a similar diminution, being one per cent. or less, in each case, as compared with from two to four per cent. during the years before the war. Warnekros thinks that these observations indicate that there is marked relation between eclampsia and diet, and, therefore, point the way to the prophylactic treatment of the disorder."

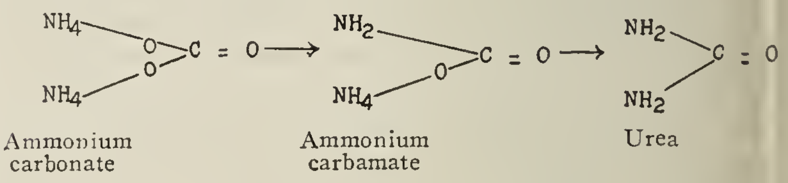
It is possible, I think, by proper study and by proper metabolic management, to prevent the onset of toxemia of pregnancy in women who are anxious to have children and who give a history of former dreadful experiences with convulsions of the mother and death of the fetus.

The metabolic disturbances that are present are secondary, in my opinion, to this dysfunction of the liver and are only easily understood if this hepatic disturbance is constantly remembered.

EFFECT ON THE AMMONIA COEFFICIENT.

It is one of the normal functions of the liver to produce urea from the byproducts of the breakdown of the body. It does this in the following way:

The ammonia which is brought to the liver in union with carbon dioxide and water is dehydrated by the liver to form urea, thus



Normally this urea forms about eighty per cent of the total nitrogen in the urine. Normally, also the liver permits only a little of the ammonia to escape unchanged into the urine. This little i about three to five per cent. of the total nitrogen in the urine. The ratio of ammonia nitrogen to tota nitrogen in the urine is the socalled ammonia coefficient.

When the liver is not functioning properly it permits much more ammonia to escape unchanged into the urine and thus increases the ammonia coefficien to very high figures, with the corresponding diminution in the urea output.

J. Whitridge Williams, in 1907, directed particular attention to the ammonia coefficient—the amoun of ammonia nitrogen compared with the amount o total nitrogen in the urine. He not only believe that the relative increase in ammonia was in direc ratio to the severity of the toxemia, but that in thi way it would be possible to estimate accurately th value of the treatment instituted to relieve the condition and also to decide how far a patient might b allowed to go before interference with pregnanc was justified. In the enthusiasm of having at las found a practical method to deal with a difficul decision, he established the rule that an increasin ammonia nitrogen of ten per cent. or more of th total nitrogen justifies interference with pregnanc Wider experience soon established a more conservative policy which Williams was among the first t adopt, but the fact remains that the ammonia coefficient is still one of the potent factors in determining just what Williams originally asserted—an inde to the severity of the toxemia as well as an inde to the point beyond which it is not safe to allow th pregnancy to go.

BLOOD CHEMISTRY.

Due to the secondary influence of the toxin ci culation on the kidneys, a condition of nephritis i induced with the retention of the various nonprotein nitrogenous compounds in the blood, such as urea, creatinin and uric acid. These substances in themselves are not the toxic factors responsible for the toxemia, but are only an index of other substances which are toxic and which overwhelm the patient.

The urea nitrogen, which normally is about sixteen mgs. to 100 c. c., is increased to fifty or over; the nonprotein nitrogen which normally is about twenty-five mgs. to 100 c. c. is increased to eighty or more. The creatinin and uric acid in the blood which are good prognosticators may be increased to four and six mgs., respectively.

ACIDOSIS.

With the nausea, the vomiting, the retention of acid substances, etc., there is a diminution of the alkali reserve with the resultant acidosis. This is not the cause of toxemia of pregnancy, but is a result of it. This acidosis is measured by the CO_2 combining power of the blood (by the Van Slyke method) and by the hydrogen ion concentration of the blood.

In the severe vomiting of pregnancy, a condition similar to starvation is set up with the resultant dysbolism of the fat into betaoxybutyric acid, diacetic acid and acetone. These substances need not be present, however, for a condition of true acidosis to exist.

CALCIUM CHANGES.

There is always a distinct disturbance in the calcium metabolism of the pregnant woman. In fact, Drennan thought that this was the cause of toxemia of pregnancy. The formation of the bony structure by the fetus causes a large mobilization of the lime salts by the mother with resultant disturbances in the calcium content of the blood. There seems to be a distinct relationship between the calcium metabolism and carbohydrate metabolism, and it is possible that this mobilization of calcium plays a rôle in the lactose output by the lactating mother.

140 West Sixty-ninth Street.

Ingestion Glycosuria an Aid to Early Diagnosis of Pregnancy*

Preliminary Report

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It is a curious fact that the first work on a test peculiarly of interest to the obstetrician should have been done in a clinic that at the time was dealing with a series of neurological cases. In 1895 Dr. R. von Jaksch (1), while studying glycosuria following ingestion of 100 grams of glucose, found it usually absent in chorea and syringomyelia, but when two cases of this sort in pregnant women reacted positively his assistant, Dr. Frederick Lanz, decided to investigate the phenomenon. Lanz (2) reported a series of thirty cases, all but two of which had reached the eighth month of pregnancy. From his work he concluded that the "assimilation threshold" for glucose is lowered in pregnancy and rapidly returns to normal after labor. Hofbauer (3), in 1899, using practically the same technic, reported forty-five cases, thirty-nine positive and six negative. His conclusions were that glycosuria is a symptom of pregnancy which disappears when the physiological relationship between the fetus and maternal parts is destroyed.

The fact that glycosuria may be seen in pregnancy as a transient symptom has been noted by various writers since 1856 when Blot (4) first brought it to the attention of the profession. In the recent literature Guggisberg (5), Cron (6), Bauer (7), Motzfeldt (8), and Wallis and Bose (9) have all reported studies on the spontaneous glycosuria of pregnancy, and their conclusions may be stated as follows: 1. The spontaneous glycosuria usually appears after the sixth month of pregnancy. 2. It is mild in type, the amount in the urine being usually less than one per cent., it is often intermittent, and there is slight, if any, hyperglycemia. 3. The sugar excretion is independent of the carbohydrate in the diet. 4. There are no other symptoms of diabetes. 5. The glycosuria disappears after labor.

The relative frequency of spontaneous glycosuria in pregnant women is given in Table I.

TABLE I.

THE INCIDENCE OF SPONTANEOUS GLYCOSURIA IN PREGNANCY.

1. Bauer,	0.75 per cent.	6. Reichenstein,	12 per cent.
2. Cron,	4 per cent.	7. Stolper,	18 per cent.
3. Williams, J. W.,	5.6 per cent.	8. Ludwig,	22 per cent.
4. Hirschfeld,	10 per cent.	9. Lepine,	40 per cent.
5. Van Noorden,	10 per cent.	10. Brocard,	50 per cent.

On reviewing the records of the Maternity Dispensary at the Hospital of the University of Pennsylvania from July 1, 1921, to January 1, 1923, in 547 pregnancy case records only four could be found in which sugar in the urine was reported. One of these was definitely diabetic and the glycosuria was therefore not attributable to pregnancy. Consequently, as far as these records go, we may say that glycosuria occurred in 0.55 per cent. of this series of cases. The high figures obtained by certain investigators are doubtless due to the inclusion of cases of lactosuria in their series. In Cron's series of 2,200 cases lactosuria occurred in 3.5 per cent. of the pregnancies.

The recognition of glycosuria as a system of early pregnancy is the clinical outcome of work done by Ryser (10) in 1916 and Gruenthal (11) in 1919. The former determined that when pregnant women were fed on a series of different sugars, the blood sugar values never exceeded normal physiological limits. The latter showed that the blood sugar curves were identical in nonpregnant and pregnant women after ingestion of like amounts of glucose, but that the pregnant women responded with glycosuria. The blood sugar values never exceeded 200 mg. to the 100 c. c. of blood. In 1920 Frank and Nothmann (12), of Breslau, published a series of cases in which they had used ingestion glycosuria as the sign of early pregnancy and had tested nineteen women without one failure. Having a preliminary specimen of blood and urine, they administered 100 grams of glucose on a fasting stomach, then collected urine specimens every fifteen minutes, and blood every hour for two hours. Considering 190 mg. to the 100 c. c. of blood as top normal for the blood sugar value, they found that the blood sugar never exceeded this figure and that the glycosuria had always appeared within one hour in positive cases. They found the test to be unreliable after the third month. A positive result was obtained from an early ectopic gestation when fetal and maternal parts were still in living relationship.

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*From the Out Patient and Ward Services of the Department of Obstetrics and the William Pepper Laboratory of Clinical Medicine, Hospital of the University of Pennsylvania.

Presented before the Annual Meeting of the Undergraduate Medical Association of the University of Pennsylvania, April 19, 1923.

Table II shows the results of other investigators in using this method. It will be noted that of 259 cases, 247 reacted positively and 12 negatively.

TABLE II.

RESULTS IN WOMEN PREGNANT ONE TO THREE MONTHS, INCLUSIVE, USING THE FRANK AND NOTHMANN TECHNIC.

Series	Positive	Negative	Negative Controls
1. Frank and Nothmann (12)	19 6 (COH meal)	0	7 4
2. Kamnitzer and Joseph (20)	16 (COH meal)	0	30
3. Nürnberger (18)	18	0	—
4. Seitz u. Jess (17)	5	5	—
5. Schilling u. Göbel (21)...	5	0	—
6. Lembcke u. Lindig (16).	16	0	—
7. Dietrich (15)	7	4	—
8. Bauer (7)	120	0	29
9. Welz and Van Nest (22)	15	3	9
10. Williams, Philip (19)....	20	0	All except one.
	247	12	

In the technic used at the Hospital of the University of Pennsylvania, several changes were made from the original Frank and Nothmann technic, as follows:

1. The patient took no breakfast and voided a preliminary specimen of urine which was tested for a reducing sugar by the Fehling test.
2. One hundred grams of Franklin granulated table sugar were given dissolved in two glasses of hot water.
3. One hour later a specimen by catheter was obtained and blood drawn from the arm, which was sent to the Pepper Clinical Laboratory where a Folin and Wu blood sugar determination was run on it. The urine was examined by the Fehling and Benedict's qualitative tests. No quantitative tests were done, for it was a foregone conclusion that the appearance of enough sugar to reduce the copper solutions would be abnormal. On two of the early positives, fermentation tests were set up to establish that a fermenting sugar was really being voided. Since these were positive, and the preliminary specimen negative to Fehling's, we felt justified in concluding that the positive reaction after the ingestion of sugar was due to glucose.

The Franklin sugar used in the test is one hundred per cent. cane sugar, breaking down to fifty per cent. dextrose and fifty per cent. levulose (27). The use of table sugar instead of glucose is a practical point that commends itself as eliminating a prohibitive factor in the original German technic, for cane sugar is everywhere available. The further simplification in taking one urine and blood specimen at the end of an hour makes toward less discomfort for the patient and is well beyond the time of the first appearance of glycosuria in positive cases (12 and 19). Folin and Borglund (13), in 1922, showed by a series of experiments that two hundred grams of pure glucose could be given a normal individual without consequent glycosuria and that a like amount of pure levulose could be given with the same result. In all our later cases, 125 grams of table sugar were used to make up for possible loss in the intestinal tract.

TABLE III.

AUTHORS' SERIES OF CASES AT THE HOSPITAL OF THE UNIVERSITY OF PENNSYLVANIA, USING FRANKLIN TABLE SUGAR.

Case	Last Seen Period	Result	Blood Sugar	Remarks
1.	9 months	positive	100 mg.	pregnant
2.	7 weeks	positive	126 mg.	pregnant
3.	2½ months	negative	136 mg.	pseudocyesis not pregnant
4.	————	negative	156 mg.	visceroptosis
5.	7 months	negative	115 mg.	pseudocyesis—no uterine enlargment
6.	10 months	positive	125 mg.	pregnant
7.	full—8 weeks scant—3½ weeks	negative	238 mg.	ruptured ectopic
8.	8 months	positive	117 mg.	pregnant
9.	11 weeks	positive	152 mg.	pregnant
10.	full-11 weeks scant-4½ weeks	positive	146 mg.	pregnant — unruptured left ectopic
11.	9 months	negative	115 mg.	pregnant
12.	5 months	positive	100 mg.	pregnant
13.	11½ weeks	positive	79 mg.	pregnant
14.	9 months	negative	165 mg.	pregnant
15.	8 months	negative	156 mg.	pregnant
16.	4 months	positive	100 mg.	pregnant—abortion one month later
17.	————	negative	———	two days after operation for incomplete abortion
18.	14½ weeks	negative	146 mg.	aborted six days later
19.	10½ weeks	positive	162 mg.	pregnant
20.	9 weeks	negative	167 mg.	pregnant
21.	————	negative	132 mg.	right hydrosalpinx
22.	10 weeks	positive	190 mg.	pregnant—child born four months before; fermentation test—positive
23.	11 days	positive	90 mg.	patient menstruating during pregnancy

Case	Last Seen Period	Result	Blood Sugar	Remarks
24.	11 weeks	positive	133 mg.	pregnant
25.	8 weeks	positive	146 mg.	pregnant
26.	9 weeks	positive	———	pregnant. Hymen intact
27.	———	positive	167 mg.	pregnant — no period since last delivery
28.	———	positive	112 mg.	pregnant — no period since last delivery
29.	7 weeks	positive	157 mg.	unruptured ectopic gestation
30.	13 weeks	negative	131 mg.	bleeding six weeks; incomplete abortion
31.	———	negative	160 mg.	nonpregnant
32.	3½ months	negative	168 mg.	bleeding two weeks; incomplete abortion
33.	———	negative	138 mg.	menstruating
34.	11 weeks	negative	103 mg.	brownish discharge for two weeks followed by miscarriage
35.	6 weeks	negative	130 mg.	nonpregnant
36.	———	negative	130 mg.	menstruating
37.	———	negative	107 mg.	nonpregnant
38.	———	positive	———	fibroids and salpingitis fermentation test negative
39.	4 months	negative	133 mg.	nonpregnant

Considering first the levels of the blood sugar, a quick glance will show that no case showing glycosuria exceeded 190 mg. to 100 c. c. of blood. This, according to Ryser and Gruenthal, is the upper limit for average ingestion hyperglycemia. The consensus of opinion in the literature seems to be that a blood sugar value over 200 mg. to 100 c. c. of blood shows a definite fault in the carbohydrate metabolism.

In order to attain some semblance of uniformity in work done on the dispensary class of patients, pregnancy on our charts is dated from the last seen period. On this basis we have fourteen positive results, and one negative result up to the end of the fourth month, and four positives and three negatives after the fourth month, all in confirmed pregnancies. The earliest recorded positive is seven weeks from the last seen period. We have three times been able to diagnose unruptured ectopic gestations, confirmed at operation, for maternal and fetal parts were still in living relationship, consequently the tests were positive. The effect of the break in this relationship is shown in cases 7, 18, and 34.

Although we have no positive result in the absence of pregnancy, there have been five reported in the literature (15); Lembcke and Lindig, ovarian cyst (16); Seitz and Jess, ovarian cyst (17), pyosalpinx, and double parovarian cyst; Nürnberger, hysteria, Fröhlich's syndrome (18).

Case 22 presented an interesting question. What value may we place on a positive test in a woman who has seen no period since her last child and is still lactating? A series of five nonpregnant lactating mothers gave the results shown in Table IV.

TABLE IV.

RESULTS IN LACTATING MOTHERS AFTER INGESTION OF 100 GRAMS OF FRANKLIN TABLE SUGAR.

Case	Urine Before	Urine After	Blood Sugar	Remarks
1.	negative	negative	158 mg.	child one week old
2.	negative	negative	78 mg.	child five days old
3.	negative	negative	153 mg.	child nine days old fibroid uterus
4.	negative	negative	87 mg.	child three days old
5.	positive fermentation negative	positive fermentation negative	114 mg.	child six days old

All the tests were negative except in the last case and here neither urine fermented, showing that no glucose was present and the extruded sugar was probably lactose. From this series we may conclude that lactation offers no bar to the use of this test and the result may be trusted even in the presence of lactosuria if the urine is fermented with yeast. This is further exemplified by case 38. The patient had been diagnosed pregnant by fifteen practitioners and specialists, her breasts were secreting, and the gynecological findings were confusing. The sugar found in running the test did not ferment, and she was therefore diagnosed not pregnant. At operation multiple fibroids and salpingitis were found, with a nonpregnant uterus. To obviate the objection raised against the Abderhalden test, we also ran a series of four normal men according to the ingestion technic and all were negative; the blood sugar values ranged from 102 to 190 mg. to 100 c. c. of blood.

Working on the hypothesis that the ingestion glycosuria of pregnancy is a type of renal diabetes, Kamnitzer and Joseph (20) proposed to find that dose of phloridzin which would not produce renal diabetes in the normal, but would produce it in the pregnant woman. Their technic as first published called for a dose of 2.5 mg. of phloridzin.

TABLE V.

RESULTS OF VARIOUS INVESTIGATORS WITH BOTH PHLORIDZIN TECHNICS.

Series	Positive	Negative	Controls Positive	Not Pregnant Negative
FIRST TECHNIC:				
1. Kamnitzer u. Joseph (20)	29	0	7	63 10 men
2. Schilling u. Göbel (21)	9	0	7 febrile	70
3. Hollingsworth (23)	17	2	6 2 men	22 5 men
4. Williams (19)	0	15	—	—
SECOND TECHNIC:				
1. Kamnitzer u. Joseph (24)	62	0	6	207
2. Zondeck (25)	—	—	15 per cent. of controls.	
3. Leskinen	13	0	5	26

In 1922 (24) Kamnitzer and Joseph published a revised technic which was adopted in our series—a preliminary specimen of urine is voided and the patient given two mg. of phloridzin intragluteally. At the same time two tumblerfuls of water are given. The urine is collected at the end of a half hour and tested for sugar by the Fehling and Benedict qualitative methods. Our results have been thoroughly disappointing. In a series of eleven cases we have had but one positive result, occurring in a nonpregnant woman with a myomatous uterus, and explained by a slip in technic, for she had a meal fifteen minutes before the phloridzin was administered. The series included six pregnancies before the fourth month, three nonpelvic affections, and two patients the day after they had been operated upon for incomplete abortions. The cause of the ingestion glycosuria is not known and from so small a series nothing constructive can be deduced.

SUMMARY.

1. Our series brings added evidence to strengthen the assumption that an ingestion glycosuria can be induced in the early months of pregnancy, that it is a valuable diagnostic aid, and that the glycosuria disappears when the fetal and maternal parts are no longer in physiological relationship. The literature shows a ninety-five per cent. accuracy with the glucose ingestion diagnostic technic in the first three months of pregnancy.

2. The use of table sugar instead of glucose and qualitative instead of quantitative tests for sugar in the urine does not affect the results, but makes the test more practicable. It is necessary to determine blood sugar only in positive cases to eliminate values over 200 mg. to 100 c. c. of blood.

3. Lactation seems to have no effect on the appearance of glucose in the urine during the test.

4. The phloridzin technic has yielded no satisfactory results.

Further study will be directed along the following lines:

1. Continuation of the sugar and phloridzin series.
2. A series of menstruating women to determine the effect of this act on the test (26).
3. A series of women at the menopause, surgical or natural, when disturbing variations of menstruation so often occur.
4. A series of women with socalled ovarian dysfunction with special reference to scanty menses, increased weight, and obvious endocrine disorder.

The authors' references will appear in their reprints.

Views and Observations on Abortions

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As the treatment of miscarriage and premature labor is essentially the same as that of full term delivery, it is not my intention to deal with either of these conditions in this paper, notwithstanding the fact that in some of the cases to be reported pregnancy had advanced as far as the fourth month. Some of the clinical pictures I am setting forth are not of the everyday variety, and are encountered more often in private practice than in hospital work. I shall emphasize only those facts which textbooks touch upon lightly, indifferently, or not at all.

CAUSES OF ABORTION.

Maternal.—In many cases we are able to find no more definite cause than obstipation, or the fact that the patient lives on the top floor, necessitating much stair climbing, or a combination of two such factors. If the uterus in its nonpregnant state is anteflexed, or normally anteverted, this position will be exaggerated during the early part of gestation, or if a normally anteverted uterus is antecessed—in contradistinction to retrocessed—or descended, this position will also tend to be made more positive at the outset of pregnancy. I have often seen such an exaggeration when but a few days had elapsed after the time of the first missed period. Unless this flexion is overcome by the softening which results from the attachment of the ovum near the internal os—particularly if the attachment is to the anterior wall—or to general softening of the uterus, or the uterine supports early become infiltrated and softened, thus permitting the uterus to ascend or recede, as the uterus enlarges the fundus will approximate and often actually impinge upon the symphysis pubis. This brings about a continuous irritation of the uterus especially during active motion and this state of irritation is supplemented by the pressure of the relatively full bladder, which is unable to fill as completely as in the nonpregnant state. Added to these two agents of irritation we may find a third—constipation—which is usually present very early in pregnancy, and serves to exert a counterpressure upon the uterus, causing congestion or hyperemia. We know that a distended bladder after delivery will often cause hemorrhage, and in the same way a distended bladder as described above in the early months of pregnancy may be instrumental in causing abortion under the conditions just mentioned.

Under normal conditions, when pregnancy begins, the uterus will descend, and as a rule, antevert and dextrovert or flex, though occasionally this turning or flexion will be toward the left. With these lateral inclinations the uterus will not be irritated by impinging upon the symphysis, the full bladder will act only as would a firm hot water bag supporting it, and the impacted rectum will have a similar influence. Thus, the position of the uterus, the action of the distended bladder and rectum, and probably other causes of which we are ignorant, in addition to acting directly upon the uterus, undoubtedly have a reflex action upon the adnexa, and help, hinder, or delay the occurrence of certain results.

If the vagina is long and narrow, so that it maintains an ascensus or suprascensus—terms used in contradistinction to descensus and prolapse—of the uterus, preventing it from sinking into the pelvis, and cutting off an increase of the blood supply by exerting pressure on the cervix and lower part of the corpus thus producing local anemia of the uterus, the embryo will die from insufficient nutrition. Rigid ligaments, or a short vagina which fails to stretch, and so limits the blood supply and prevents the rising and growth of the uterus, will have a similar effect. The uterus may also be prevented from rising out of the pelvis and enlarging by the existence of fibrosis or hypertrophy, particularly when associated with adhesions, which will result in similar conditions of anemia and malnutrition.

Another cause of abortion is an infantile uterus which has developed sufficiently to permit conception but which is unable to enlarge in proportion to the growth of the embryo.

Fetal.—When conditions favor excessive motility of the fetus, the cord may become so twisted as to cut off the blood supply to the embryo. I have seen three cases of abortion where the cord was twisted as tightly as a fine screw thread and no other cause for the abortion was observable. In another case of ten weeks' gestation, the cord showed a black smooth surfaced area embracing its entire circumference and about three sixteenths of an inch long, which had no characteristic twisting. This was undoubtedly a case of apoplexy of the cord.

It is also certain that functional or organic factors inducing sterility may at times abate sufficiently to permit conception to take place, but will thereafter operate to produce expulsion of the ovum.

SYMPTOMS OF ABORTION.

Threatened abortion.—In addition to predisposing causes, with or without bleeding, and usually occurring between the tenth and twelfth weeks of gestation, I wish to include the following picture: A large uterus of unusually hard consistency, descensus, immovably fixed, anteflexed and apparently that part of the fundus which embraces the continuation of the structures of the tubes and round ligaments forming a hard crest or spine. This spine is the most anterior part of uterus and is located behind or impinges upon the symphysis. Unless the uterus can soften and rise out of the pelvis the patient will abort. In primiparæ the uterus may be moderately cystic instead of hard.

Inevitable abortion.—Here we have much more profuse bleeding than when the abortion is merely threatened, accompanied by more regular labor pains, complete disappearance of flexion at or above the internal os, a coneshaped corpus and cervix, and the cervix including the internal os more or less dilated. I have seen a large number of cases with bleeding as the only symptom and where it would seem as if the uterus—although unable to rise out of the pelvis—had made one supreme effort to do so, for it will be found to be supracessed, of an even, firm consistency, having lost its characteristic cystic feel, and likewise the vaginal walls will be supracessed and the vault of the vagina very tensely drawn up and widened out, forming a conical dome enclosing a hollow space, which disappears after abortion.

As all the patients whom I have seen in this condition aborted within two or three days, I feel justified in classing it as one of inevitable abortion. I have seen many patients—both pregnant and nonpregnant—in whom the palpating finger could make out a similar "dome shape," but always the cervix was in normal position, and the vaginal wall so soft and relaxed that it yielded to palpation. This indicates the part the vagina plays in abortion.

In any case where bleeding is the only symptom the appearance of the discharge upon the examining finger is of diagnostic significance. When it has the consistency and color of mud, or is of a dirty ashen shade, it is at least evidence of a threatened abortion and this is likewise true if it is mucosanguineous with a large proportion of mucus, of a dirty yellow color and a consistency suggestive of soft Limburger cheese. Such a fluid is usually composed of the alkaline constituents of blood, possibly shreds of amniotic membrane, discharged as a result of decidual endometritis, mucus from the cervical plug, and probably an admixture of seminal fluid, all acted upon by the acid vaginal secretions.

But if the examining finger brings away a thin, transparent albuminosanguineous fluid containing translucent particles, the edges of which merge with the containing medium, we have positive evidence that the embryo is dead, as it indicates that the amniotic membrane is undergoing decomposition. This latter phenomenon is due to the fact that the amniotic membrane is ordinarily the weakest attachment of the ovum, as well as the lowest and most insufficiently supplied with blood; moreover, it is the most attenuated because of the stretching effect of the weight of the liquor amnii and fetus.

In missed abortion of about two or three weeks' duration or longer, the uterus will as a rule change from a cystic to an edematous consistency. A typically edematous uterus with symptoms of threatened abortion, and more particularly when the consistency is known to have changed from cystic to an edematous condition, is diagnostic of the death of the ovum. On the other hand, missed abortion, taking place before physical signs of pregnancy have appeared, will give no uterine evidence of pregnancy until the patient actually aborts.

TREATMENT OF ABORTION.

If abortion is merely threatened, do not give ergot, even in very small doses, as such measures will usually not only fail to stop the bleeding but will tend to make abortion inevitable. This latter result, in my opinion, is brought about either by the temporary diminution in blood supply (nutrition) or by retaining the blood which would otherwise come away, and as this retained blood increases in amount and forms an enlarging clot, it will gradually separate the ovum; or by the contraction of bloodvessels and uterine wall, the secondary relaxation of the same will cause increased bleeding and increased separation of the ovum.

In inevitable spontaneous abortion, when bleeding is either slow and moderate, or profuse with sudden onset, with or without pain, one c. c. of aseptic ergot, hypodermically administered even without vaginal packing, will prevent hemorrhage, or reduce bleeding to a minimum by causing contraction or hardening of the uterus or by serving to bring on strong pains, and with such conditions present we have little danger of hemorrhage. In general it will hasten and facilitate the process of emptying the uterus. If there are no pains they will be brought on within twenty-four hours, and in my experience the dose has not required repetition. Should the indications warrant it, however, the dose may be repeated any time within the twenty-four hours. As a further precaution against hemorrhage, watch for distended bladder and impacted rectum.

Although the uterine content may apparently be completely expelled, in the large majority of cases (proved by curettage) enough decidua and placental tissue may remain to delay involution, cause chronic subinvolution, or retard the closing of the cervix. Putrefaction and subsequent infection are thus invited, and even if these do not take place, we may have bleeding or spotting for an indefinite period, sufficient to reduce greatly the patient's general vitality. The condition of the tubes and ovaries must also be considered. While I do not advocate curettage indiscriminately, by doing so under strictly aseptic precautions immediately, or within twenty-four hours if bleeding is not profuse, all these sequelæ may be obviated. Proper aseptic conditions can usually be obtained almost anywhere if sufficient caution and intelligence are exercised. If the patient is not in a hospital all the instruments should be left in the sterilizer, pouring off only enough water to keep them at least partially submerged and adding lysol to the water, and taking them directly from this bath as they are needed. Swabbing out the vagina with an antiseptic solution applied by means of cotton held in a dressing forceps is superior to using a douche alone, but the combination of the two is still better. If, in the presence of retained secundines, curettage is for some reason contraindicated or otherwise undesirable, repeated tight vaginal packing with aseptic or antiseptic gauze, supplemented by one or two hypodermic injections of pituitrin, will accomplish the same result. It is my custom to give pituitrin immediately before undertaking a curettage, instead of afterward, as is more commonly practised. By causing rapid and profound contraction of the uterus it reduces to a minimum any bleeding which may be taking place—often a very important consideration—facilitates prompt evacuation of the uterus by folding or puckering up and detaching the ovum so that it is easily reached by the curette or placental forceps, and tends to harden the uterine wall so that it offers more resistance to the curette and so also minimizes the danger of perforation.

A sharp curette is, in my experience, preferable to a dull one, especially in cases of sapremia. An exception to this is in cases of parametritis, where the secundines have undoubtedly been absorbed, or the trouble has advanced beyond the stage where local treatment of this sort would be of any avail, and interference might be productive of grave injury.

We use the curette to remove retained or infectious material, and while the dull curette, it is reasonably argued, may not open up new avenues of infection, it will not accomplish the results desired, as it merely glides over the surface of the relaxed uterus and has no effect on the uterine contractions. The sharp curette, on the other hand, if used with care, will remove the infectious material and in addition the very action of the curette upon the uterine wall will have a stimulating effect upon the contracting power of the uterus. Here I wish to add that the sharp edge of the curette on account of the curve of the tip or the bend of the shank, has an eccentric slant toward the distal or proximal direction and this helps to prevent cutting into the uterine wall. The concave intrauterine surface has a similar influence. When a dose of pituitrin has preceded the curettage, further contraction will be stimulated which will facilitate uterine emptying, and will help to clear out the infective material filling the sinuses which are so often present in these cases. Blood lost at this time will have a general depleting effect upon all the pelvic organs. A uterus thus contracted with sinuses obliterated will act as a barrier against further absorption into the circulation and any secretion or toxic material that might still be present will find its natural exit. With a chronic subinvoluted or fibrosed uterus there may be little or no contraction and retraction even after it is completely evacuated or apparently so. Such cases may also be followed with pituitrin. When I have finished the curettage I swab out the uterine cavity with undiluted tincture of iodine applied by a saturated absorbent cotton swab held in a uterine dressing forceps. I consider this far superior merely to inserting and shortly removing iodine saturated gauze. When a uterus has been thus treated there is very little chance of infectious material being left to be absorbed into the circulation.

Frequently, if the uterus is imperfectly emptied, whether spontaneously or after curettage, the patient will continue to have a show of blood, and the cervix will remain partly open. The uterus will be relatively large, and have an edematous (not cystic) feel on palpation. This state will continue until the secundines are absorbed or discharged piecemeal, but if this fails to take place the bleeding will usually end with the first regular menstruation following the abortion or curettage. In these cases if one would go deeply into the history he would, as a rule, discover that something was taken or done to terminate the pregnancy. The time of onset of menstruation is very irregular, ranging all the way from one to eight weeks in different patients, and during this menstrual period bleeding may be more profuse than usual, frequently assuming hemorrhagic proportions. In some cases bleeding will continue for months and only be stopped by recuretting, especially if we are dealing with a fibrosed or hypertrophied uterus. Ergot seldom helps in these cases, except to diminish the bleeding temporarily. Pituitrin will prove somewhat more serviceable as it causes stronger uterine contractions, but these contractions will not expel or even separate the retained secundines, if they are strongly adherent, as is usually the case. If the uterus is not hypertrophied or fibrosed, repeated vaginal packing and hypodermic injections of pituitrin will ordinarily take the place of curettage.

THERAPEUTIC ABORTION.

I once assisted a well known gynecologist in curetting a patient three months advanced in her first pregnancy. Irregular bleeding had continued for about four weeks, and the uterus had only attained the size of a nine or ten weeks' gestation. While curetting it was found to be a case of *uterus septus*, the septum being broken by the manipulation of the curette. The patient has since given birth to two full term children. When the operator withdrew the curette I suggested that he had not finished; to which he answered, "Didn't you hear the grating sound?" I contended that the sound was not sufficiently "grating," and more significant still, the uterus had shown no signs of contracting. I had observed that the last stroke of the curette penetrated almost as deeply as his first one. When he suggested that I demonstrate my meaning, I took the curette and after removing a considerable quantity of residual tissue, a more decided grating sound was elicited which was not only more clearly audible but was also palpable and the uterus immediately contracted about an inch in all its diameters. My chief at once admitted that I had been able to teach him something about curettage, and recently—more than nine years later—he repeated this admission.

When a therapeutic abortion must be done, it is well to wait until the uterus is sufficiently softened, as the cervix will then dilate more readily, and if dilatation is carried out slowly and only very gentle force employed, there will be much less cervical trauma and pelvic shock. The uterus will also contract more readily and perfectly during the emptying process, and remain fully contracted, and thus the socalled reaction which sometimes follows curettage and which is often mistaken for infection will be obviated. In a congenitally flexed and unyielding uterus the dilatation must overcome this condition of flexion; otherwise, the secundines in the space above the flexion cannot be reached by the curette, in some cases sufficient tissue being left to continue the pregnancy. It makes no difference whether the flexion is located in front or behind, except that if it is behind and the uterus is also adherent it will increase the size of the impenetrable area.

When the uterus fails to contract although the corpus and fundus are apparently clear, judging by the amount of material removed and the grating sound elicited; or the contraction is insufficient and profuse bleeding continues; or during the operation, the curette encounters a soft, nonresisting, nongrating bed of tissue at or above the internal os, which proves very difficult to remove, it indicates either that flexion has not been overcome, or that the membranes encountered are exceptionally adherent. In either case satisfactory curettage can be obtained by still further dilatation, and giving especial attention to dislodging the tissues in the unyielding area above the flexion. Increasing the bend of the shank of the curette near the tip is of great service. If no pituitrin has been given before the intervention is begun, we may find ourselves confronted by a soft uterus in a profusely bleeding patient, with the ovum coming away very slowly, or possibly no progress whatever being made because the uterine wall offers little or no resistance to the curette. In such a situation pituitrin should be administered and the curette applied to the lower half of the uterus with a lateral and rotary stroke and a downward stroke, withdrawing the curette to the outside of the external os at every downward stroke. After this has been done systematically and completely all around, the ovum should be further loosened at the fundus, and as much as possible of it removed with the instrument. Failure to contract means that the area at or above the internal os has not yet been completely evacuated. In this area the membranes are usually more adherent than in any other part of the uterus, but when it is denuded as far down as the endometrium, the added stimulation to contraction at the internal os, which is effected by curettage, will cause a firmer contraction of the uterine wall so that it will offer sufficient resistance to the instrument to enable one to peel away the ovum. At first, uterine contraction will simply be manifested by this hardening of the uterine wall, but as the emptying process proceeds there will be a noticeable diminution of intrauterine space. When the secundines are completely loosened and the uterus is almost empty, a healthy uterus will now complete its contraction rapidly which is evidenced by the increased flow of blood, the sudden diminution in the size of the uterine canal and the cramplike pain which the patient experiences for a few minutes and occasionally for a much longer period. Curettage for hyperemesis gravidarum, if not done too late, gives instant relief; many patients feel the relief even during the process of curetting.

BALLOONING OUT OF THE UTERUS.

Occasionally we encounter a very soft and cystic uterus, the size of which is out of proportion to the duration of pregnancy, with walls excessively infiltrated, or distended by an unusually large amount of liquor amnii. Under such conditions, especially about the end of the third month of gestation, we may encounter a cervix which will dilate so easily that practically all one has to do is to estimate the extent of dilatation present. In any case where the cervix dilates in this way we are likely to encounter excessive bleeding. When the curettage is being attempted the operator may not succeed in reaching the fundus, or he may reach it at first but lose track of it a short while later, and may even fear that he has perforated the uterine wall, so that the tip of the curette is in the abdominal cavity. Such a condition has been described as ballooning out of the uterus.

I have observed eleven cases of therapeutic abortion where this condition was present, and it was noticeable that all the patients were highly neurotic. Ten were blond or of light complexion, and one was very dark, and all were greatly worried over their condition, or its probable outcome. My explanation of this peculiar uterine condition takes into account the patient's psychic state, some organic disease on account of which the abortion is indicated, and, possibly, the effect of the anesthetic (six had anesthesia), added to the physical peculiarities of the uterus itself, as outlined above. The constant relaxation and contraction of the uterus goes on throughout pregnancy and during a dilatation the nerve control of that organ may be temporarily suspended, so that it fails to contract naturally and will "balloon out," partly at the expense of the constriction and flexion at the internal os, and the tapering lower segment of the corpus uteri, and partly on account of the general softening of the uterus. While some of these patients have not been catheterized prior to curettage, it is possible that a full or partly full bladder was also one of the causative factors.

We shall then see come to pass in a few seconds what normally requires three or four months for Nature to accomplish. It is possible to perforate the uterus during the stage preceding the ballooning out, but no further in extent than the width of the curette's tip. The operator who does not lose his head will realize that it is impossible to strip away the entire fundus and upper portion of the corpus and by tilting the curette in different directions he will soon encounter the uterine wall. They were all associated with more or less profuse hemorrhage. Although the condition has every appearance of being a very grave one, the patient's only reaction with moderate hemorrhage will be a slight acceleration of the pulse rate, when one would be led to expect extreme shock and possibly collapse. In four of these cases, where bleeding was profuse, the patients presented symptoms of dimness of vision, yawning, faintness, and passing of flatus, with rapid and thready pulse. They all quickly rallied as soon as the uterus was completely evacuated. Less extensive ballooning, when one does not lose track of the position of the fundus, is not uncommon in obstetrical practice.

It will be quite useless to attempt to continue the curettage, however, as the instrument will merely glide over the soft yielding uterine wall, and produce nothing except an increased flow of blood. An injection of one c. c. of pituitrin should be given, and its action awaited before continuing the operation. Resume curetting from a convenient height without looking for the fundus, using a downward stroke and bring the instrument frequently outside the external os. As the contents are removed the uterus will contract, and the fundus descend of itself, as in any other case. Should one c. c. of pituitrin fail to bring about the desired hardening of the uterine wall, the dose may be repeated, or one c. c. of ergot given. Such an outcome can usually be avoided by giving the pituitrin before undertaking the curettage.

Except in primiparæ, the use of anesthesia can usually be avoided, a little tactful management and cheerful reassurance on the part of the operator being all that is necessary. If the patient is conscious, when the uterus balloons out or contracts sluggishly, she can be directed to make use of the abdominal muscles and by bearing down strongly, the uterus can be made to contract temporarily, and the curettage be continued during the straining movements, as all that is really necessary in the vast majority of cases is to peel away a few portions of the ovum until the endometrium is laid bare, whereupon the uterus will begin to contract. This is especially effective near the internal os. When no anesthesia has been employed the patient's respirations after a short while will become slow and shallow, due to the fear of pain, and the reflexes incident at this time from the slight gnawing pain actually caused by the monotonous movements of the curette, added to other psychic causes. This respiratory factor undoubtedly has an influence in delaying contraction and favoring relaxation. Give the patient two or three minutes' rest, and she will draw one or two deep sighing respirations which will be followed by normal breathing. If curettage is then resumed the uterine wall will be found firmer and the contents will peel away more readily. In a few cases several such rests may be necessary, even if the pituitrin injections and the bearing down movements have also been employed, before we can bring the operation to a satisfactory conclusion. The practice of swabbing out the uterine cavity with pure iodine is always followed in these cases, but I never make use of a uterine drain or vaginal pack, nor employ an intrauterine douche. I have seen many cases of trigonitis and general cystitis following a curettage which was done in the presence of a distended bladder. The importance of seeing that the bladder is fully emptied before beginning to curette needs no emphasis.

1851 SEVENTH AVENUE.

Gumma of the Cervix Uteri*

By HARRY A. DUNCAN, A.B., M.D., F. A. C. S.,
Philadelphia, Pa.

My object in this brief paper is not to tell you something new about syphilis of the cervix uteri, but to point out some old lessons which the experience of the last year leads me to feel are being overlooked. Carcinoma of the cervix, especially a large cauliflowerlike growth, is being diagnosed at the present time by a large number of medical men without the use of the microscope. The well known danger of metastasis from manipulation and especially from the removal of a section of tissue for microscopic examination is the explanation. So much is the dissemination of this local disease feared by many surgeons that in applying radium they will not dilate the cervix even enough to receive the radium capsule.

Men like Bloodgood have taught us to look for carcinoma in an old specific lesion of the tongue. They have told us that one of the chief causes of carcinoma of the tongue is an old specific lesion. Perhaps the same intimate relation between syphilis and carcinoma in the cervix does not often present itself, but I am of the opinion that such a relation does exist and is often overlooked. I present herewith a few brief case histories for consideration.

CASE I.—The patient, Mrs. C., had just had a profuse vaginal hemorrhage when I was called in to see her in April, 1922, and I found a minister at the bedside administering the last rites. She presented all the symptoms characterizing a severe loss of blood. From the husband I gathered a few points in the history of her illness. The family doctor was ill and they had called me in the emergency. One year previously the family doctor had told the family that the patient was suffering from inoperable carcinoma of the cervix, and this diagnosis had been confirmed by a surgeon who applied radium in June, July, and November, 1921. I do not know the amount given. A hurried examination revealed a large cauliflowerlike mass filling the vagina and vesical and rectal fistulæ, either one large enough to admit the tips of two fingers.

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*Read before the Samaritan Hospital Society, May 14, 1923.

The case seemed so hopeless that little treatment was attempted. The foot of the bed was elevated and a pint of normal saline given under the skin. To our surprise some improvement followed. In a few days the patient was strong enough to be questioned. Only one other fact of any importance was elicited. She had been married twenty-five years and had given birth to four stillborn babies. To withdraw even a small amount of blood for a Wassermann test did not yet seem justifiable but .45 gm. of neoarsphenamine was administered and repeated every week for ten weeks.

The large mass disappeared from the vagina, there was no further loss of blood, and the patient's general improvement was so marked that, despite the annoying fistulæ, she went to church and took daily walks of several blocks. About this time edema of the feet and legs was noticed. It was impossible to secure a good specimen of urine. Four months after I first saw the patient, on her return from a long ride in the park, uremia suddenly developed and she died.

I begged for a postmortem and obtained permission for a partial autopsy. I found the right kidney about half the normal size and very fibrous. The left kidney was entirely destroyed, only a small cyst remaining. There was no evidence of carcinoma in the liver, lymphatics or elsewhere. Only a small portion of the fundus uteri remained. Macroscopically it presented a normal appearance, but microscopically Dr. Clark found carcinoma.

Case II.—The patient, Mrs. O., was referred to me two years ago with the diagnosis of carcinoma of the cervix. On the posterior lip of the cervix was a cauliflower growth the size of an English walnut which bled freely. Pressure with gauze controlled the bleeding. This aroused my suspicion. In her history she had told me she had four children living and well, but on going over the history again I learned that her first two pregnancies resulted in stillbirths at about the seventh month. Wassermann test was four plus. Syphilitic treatment caused the cervix to become normal in appearance.

Case III.—The patient, Mrs. W., when I first saw her six months ago, was extremely pale, semicomatose, and seemed to be in a dying condition. The family doctor said she had returned from a neighboring hospital one week before where she had received her third radium treatment for carcinoma of the cervix uteri. The husband stated they had been married ten years, and she had been pregnant but once. This resulted in a stillbirth. Despite the fact that she had had three radium treatments the cervix was large, spongy, and friable. The os admitted the finger tip. The whole uterus was large and fixed. I suggested a Wassermann. In a few days the report came back four plus. She was given three doses of neoarsphenamine. For some reason her teeth all fell out. She had no further bleeding and was able to go about though her condition was still bad. I have seen her but once since and cannot state what has happened to the cervix.

Partus Serotinus

By W. A. NEWMAN DORLAND, M.D.,

Chicago.

Prolongation of pregnancy to approximately ten and a half to eleven months is not so frequent an occurrence as to warrant its dismissal without comment. In the case herewith recorded an interval of 368 days elapsed between the dates of the last menstruation and the delivery of the child. Allowing the usual three weeks, or twenty-one days, as the interval following the last menstruation in which conception might not have taken place, we have left 347 days. If we allow another six weeks or forty-two days for the irregularity previously noted in the menstrual history of the patient, we still have left 305 days for the duration of the pregnancy—that is, thirty days or four weeks over the average length of gestation. The unusually large dimensions of the infant's head, as accurately determined on the day of delivery, corroborate such a period of prolongation of intrauterine growth. The history of the case is as follows:

Case.—Mrs. S. J., primipara, aged twenty, was born in Turkestan, Asia, of Jewish extraction, and had been married two years. Puberty occurred at thirteen, but menstruation had never been regular. The patient stated that she would at times miss two or three months. Her last menstruation occurred on December 12, 1921. She experienced considerable nausea and vomiting about Easter, which occurred toward the end of March. She could not recall the date of quickening but thought it was about June 1st. Since then there had been active fetal movements. Her health was perfect; she had normal blood pressure and urinary findings, but for the last few days there had been slight swelling of the ankles. The week before she came to me she had visited the Lying-in-Hospital and was told that she should have an immediate Cæsarean section. Her physician, Dr. E. H. Slott, brought her to my office on December 9, 1922. Examination revealed great distention of the abdomen which was drumlike in its rigidity, with fetal movements easily palpable and visible. The fetus lay in the second position of the vertex presentation, its head, appreciably larger than normal, resting in the false pelvis and projecting over the pelvic brim. The x ray plates taken by Dr. M. J. Hubeny confirmed these findings. The fetal heart tones registered 140. Pelvimetric examination showed a normal Baudelocque's diameter with a slight transverse contraction of the brim of the false pelvis, the interspinous diameter being twenty-four and a half cm. and the intercristal diameter twenty-eight cm.

The patient was advised to wait another week, at the expiration of which time, if she did not spontaneously fall into labor, a Cæsarean section would be performed. Five days later labor pains began at one o'clock in the morning and at four o'clock the operation was made through high supraumbilical and fundal incisions. A living male child was delivered weighing ten pounds and presenting the following dimensions: Circumference of the head at the level of the parietal bosses, fourteen and a half inches (thirty-six cm.); biparietal diameter, eleven and a half cm.; bitemporal diameter, ten and a half cm.; trachelobregmatic diameter, fourteen and a half cm.; occipitomental diameter, twenty-two cm.; frontomental diameter, nine and a half cm.; length of the fetus, twenty and a half inches (fifty+cm.); weight of the placenta, thirty-two and a half ounces (two pounds one half ounce). There was about the average quantity of liquor amnii. The apparent disproportion between the length of the child and the size of the head could be accounted for by the father's build. He was a short Jew, but slightly over five feet in height, and with an unusually large head development.

The average duration of pregnancy is from 272 to 280 days, but probably, in about six per cent. of pregnant women this, as von Winckel has shown, may be extended to over 300 days. Duncan remarks that in some of the cases of undoubted prolongation of pregnancy the child is no longer than one at full term, although it may attain an enormous size. Murray records a case in which the interval between the cessation of menstruation and delivery was 330 days, Velpeau one of 310 days, R. Wilson one of 348 days (eleven months, fourteen days), and other authors cases in which the interval was just eleven months.

25 East Washington Street.

Meddlesome Obstetrics*

By JAMES R. McCORD, M.D.,
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It is a matter of common knowledge that, in the vast majority of cases, the bad results obtained in obstetrics, as ordinarily encountered in general practice, are caused by meddlesome midwifery.

If the man who is to do general practice is given a thorough groundwork in the mechanism of labor, and if he is the possessor of an ordinary amount of common sense, obstetrics will lose most of its terrors and mysteries for him, and his results will be incomparably better than those of his brother who does not know the mechanism.

For years I have stressed the fact and taught students that so long as the mother is in good condition, the membranes unruptured and the fetal heart sounds good, there are no indications that will demand active interference. The pleadings of the patient or of her family should never throw the obstetrician off his equilibrium and cause him to interfere needlessly.

CAUSES OF DELAYED LABOR.

A full bladder is, in my opinion, the most common cause of delayed labor and one that is overlooked a surprisingly large number of times. The frequent micturition which occurs during labor should not throw one off his guard. If the patient cannot void, and if there is any doubt about the bladder's being empty, she should be catheterized. A rubber and not a glass or metal catheter should be used for this purpose. Many cases of poor contraction and retraction observed after the third stage of labor, accompanied by bleeding, are caused by overdistended bladders.

The occipitoposterior positions are, in my experience, meddled with unnecessarily more often than any other obstetrical condition. The causes of these positions are the factors of an almost constant first stage delay. The patient becomes worn out on account of painful, irritating contractions and lack of progress. There is delay in dilatation and effacement of the cervix. Pituitrin is contraindicated here, and if morphine is given for effect, it is much better treatment than premature meddling. I have found that the best way to quiet the family is to quiet the patient.

Dilatation of the cervix alone cannot be considered, but must include effacement. The impatience universally displayed by doctors, and the meddlesome interference before there is complete dilatation and effacement of the cervix, account for an enormous number of poor obstetrical results in both mother and child. It is easier to do a manual dilatation on paper than on a woman. The dilatation of the cervix can be carried out manually to a point where delivery of a full term fetus can be done; but complete effacement cannot be done manually, and a full term baby cannot be pulled through a cervix before effacement is complete without great damage. Many women are invalids today from this one phase of meddlesome obstetrics.

I believe I am correct in stating that the Braxton-Hicks version is the method of treatment most universally employed in placenta previa. It is meddlesome and not without grave danger to complete delivery immediately when the cervix is not fully dilated and effacement is not complete. Fortunately, this is not always the case. I do not mean to say that the conditions demanding such a procedure never arise; they do, but very infrequently, and such a procedure, in the great majority of cases, is meddlesome.

I have often stated that to obtain an estimate of a man's real ability in obstetrics, it is necessary to

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*Read before the Emory University Alumni Society, June, 1922.

watch him conduct the third stage of normal labor. Meddlesome midwifery is a powerful influence here. If I ever succeed in gaining enough obstetrical knowledge to write a textbook, in it no mention will be made of Credé's method of expressing the placenta. No doubt there are indications for its use; but the majority of students get the wrong conception of it, and "meddlesome obstetrics" uses it as another means to prevent good results. I do not believe in putting a time limit on many conditions in obstetrics; but if, after the birth of the child, thirty minutes were allowed to elapse before efforts were made to express the placenta, there would be fewer cases of postpartum hemorrhage, fewer subinvolutions and fewer prolapsed uteri. If left alone, the placenta will always drop into the lower uterine segment when Nature has separated it, and it can then be gently expressed by DeLee's method of early expression. The placenta separates by the alternate contraction and relaxation of the uterus. Constant massage of the uterus during the third stage of labor prevents the necessary relaxations, and defeats the purpose in a normal labor. The hand should be placed lightly on the abdomen, so as not to lose the uterine contour. Personally, I do not invade the uterine cavity for shreds of membranes and small pieces of placenta.

I admit that the general practitioner must conserve his time; that he cannot sit with obstetrical patients as other men do who specialize in this line of work. It is important that the man doing general work should know accurately the progress of labor. I think this knowledge is much more safely gained by rectal than by vaginal examinations. If in doubt about the normality of the case and vaginal confirmation is needed, then do the vaginal examination. I have never yet done a vaginal examination, during labor, through an unshaven vulva and without rubber gloves. Doctors speak freely about the mortality in cases of puerperal sepsis, but little is heard about the morbidity.

Some authorities advise the routine prenatal care of the nipples, in various ways, to get them in a soft and supple condition for nursing. I have always considered this routine method "meddlesome obstetrics." The only exception I make is in cases of inverted nipples. I have never seen a case of breast abscess in which a history could not be obtained of sore, fissured or eroded nipples. The moral is, no fingers, absolute cleanliness, and a nipple shield, upon the first evidence of tenderness.

The mammary engorgement that occurs about seventy-two hours postpartum is not, as so many doctors think, the engorgement of milk but a venous and lymph congestion. A tight breast binder, an extra baby borrowed from some neighbor, or even the ancient proverbial puppy, can all be classed as meddlesome obstetrics. A saline, an ice bag, possibly codeine for pain, may be given. These three simple measures usually suffice for prompt relief. Binders are indicated only when the breasts are heavy, pendulous, and swing down over the curve of the ribs, the ribs interfering with the circulation, causing stasis. A folded towel is placed at the sides of the breasts, and a loose binder holds them on top of the chest. Drying up the milk secretion by a tight binder, breast pumps, etc., is wholly unnecessary. A saline laxative and small doses of codeine are all that is needed for this uncomfortable period, which lasts about thirty-six hours.

I have always taught that the use of vaginal douches during pregnancy was meddlesome. The one exception to this rule is in the case of an active gonorrhea. The traditional early postpartum douches are not indicated. In occasional cases of sapremia and septic infection I use low vaginal douches. I never rupture membranes artificially.

The resuscitation of newborn infants by the methods of Byrd, Schultz, and Prowchownick are to be condemned as meddlesome. I have seen, in autopsy, as the result of these methods, a ruptured spleen, and ruptured liver and kidneys. Simple inversion and letting the baby alone until the cord ceases to pulsate are usually all that is necessary. The mucus may be drawn from the posterior pharynx and trachea by a rubber catheter. It is very necessary, in the treatment of these cases, not to allow the baby to get cold. If artificial respiration becomes necessary, I prefer the mouth to mouth method.

The application of forceps to the unengaged head is not only meddlesome but obsolete. Forceps should not be applied until the head is engaged and the cervix dilated and effaced. In addition to these conditions I always try to wait for anterior rotation of the occiput. Disregard of these facts is the cause of many stillbirths and cranial hemorrhages in the newborn.

It is an indisputable fact that the Cæsarean operation is being abused. Do not do it just because it is the easiest way out. The mortality from this cause is higher than from abdominal sections performed for all conditions. The general surgeon, acting as an obstetrical consultant, often does the operation unnecessarily through lack of knowledge of obstetrical details.

Pituitrin is used by many doctors as an aid in their practice of meddlesome obstetrics. I am absolutely convinced that this drug, as ordinarily administered, is dangerous for both mother and child. Briefly stated, I think the following are indications for its use:

1. The cervix must be dilated and completely effaced.
2. The head must be through the cervix, with anterior rotation of the occiput.
3. There must be no disproportion between the fetal head and the maternal pelvis.
4. There must be uterine inertia: never unnecessarily whip up a hardworking uterus with any oxytocic.
5. The dose should be small, three to five minims, repeated if necessary.
6. Pituitrin can be given immediately after the birth of the child to control hemorrhage and hasten the third stage of labor, upon good authority.
7. Pituitrin should never be used in abnormal presentations.

I am fortunate in having enjoyed a wide experience in obstetrics, and, as a result of that experience, I plead for a more universal acceptance of the following:

1. Learn thoroughly the mechanism of labor.
2. Never interfere with any labor that is progress-

ing normally. A slow labor is not an abnormal labor.

3. A full bladder is the most common cause of dystocia.
4. Pituitrin is a dangerous drug.
5. Do not rupture the membranes artificially.
6. Practice conducting labors by abdominal examinations.
7. Conserve the anatomical parts of the patient, not your time.
8. A greater proportion of women in labor need sedatives rather than oxytocics.
9. Manual dilatation and effacement of the cervix is not possible.
10. Treat occipitoposterior positions expectantly, as long as you think possible to do so, then just a little longer.
11. A version performed for hemorrhage, through an undilated and uneffaced cervix, must not be completed.
12. Manage patiently the third stage of labor.
13. Nipple trouble always precedes a breast abscess.
14. Douches are contraindicated.
15. Apply forceps after mature deliberation; never too soon.
16. Violent methods are never necessary in the resuscitation of the newborn.

20 East Linden Avenue.

A New Theory of Menstruation

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The previous theories of menstruation may be grouped around a few main ideas as follows: first, that it is a cyclic throwing off of a portion of the endometrium; second, that it is due to the maturing of a Graafian follicle with the resulting corpus luteum; third, that it is caused by an internal secretion; still another, that it provides a rich pabulum to nourish the embryo. This article presents the possibility that menstruation may be a function established to provide blood albumen as support and possible nourishment for an ovum during the predecidual period.

A study of the life cycles of many disease bearing insects has brought out the fact that ova are never stationary. A certain degree of rotation seems to be a biological need, for example, the anopheles mosquito selects vegetable matter in a watery incubator. She places her eggs in designs referred to as floats. The culex mosquito selects a different pattern, she makes a raft. The yellow fever mosquito "lays eggs singly in small irregular groups some distance above the water. They are laid in from one to seven days after the female has fed upon blood," and usually after successive blood meals.

We find that the following places are selected as suitable positions for the development of fertilized ova of insects: quiet waters, grass blades, water lilies, the under side of leaves pieces of stick, rocks, hairs, threads, etc. In the case of frogs the ova are laid singly or in small clusters, while toads lay them as long unbroken strings and in each case they maintain this original design until such time as their development reaches a stage when the individual embryo can exist independently. The ova of many of our disease bearing insects are deposited in masses. Many fish ova are deposited in the water and are fertilized there. Where the ova are discharged in masses they are held together by a gluelike substance and even when each is deposited separately it is attached by a gluelike substance to some support. Take as an example the head louse, which deposits the egg on a hair or thread and cements it there.

In the study of chick embryology it is found that the eggs in the incubator must be rotated twice daily for a certain number of days in order to prevent deformities. The hen does the same thing for the eggs in the nest. It is only when the fertilized hen's egg is placed under proper conditions, and not till then, that segmentation begins.

Many insects protect their eggs with a gelatinous substance. It is known that the ovum of many animals become surrounded by a gelatinous covering. In rabbits this envelope becomes enormously thick about the blastodermic vesicle: and this is the stage, we are told, when the human embryo is supposed to reach the uterus.

All ova are of such a shape that a rotary motion can be carried out with a minimum of jar. Nature is extravagant in the extreme when it comes to the perpetuation of a species—she does nothing purposeless or useless.

The few instances cited suggest, 1, that ova are generally protected or supported by some kind of an adhesive or gluelike substance, and 2, that a limited amount of movement is essential to prevent deformities.

Perhaps you are asking how this has anything to do with menstruation? In textbooks the term implantation is used to describe the manner of the embryo's attachment to the uterine mucosa. One textbook goes so far as to say, "That the human embryo penetrates the mucosa as would a parasite." Let us suppose that fertilized ovum is discharged from the fallopian tube into the uterus, it is nothing more than reasonable to conclude that the menstrual function has had some share in preparing for its reception.

Menstrual blood we know differs from blood from other sources in its normal noncoagulability. Why this is so no one has as yet satisfactorily explained. Something may have been added, something may have been held back. In the hours while the decidua are developing could anything support, protect or permit motion of the ovum better than blood albumen? The albuminous cradle of the chick embryo may have its counterpart in the human provided by blood albumen during the first hours of intrauterine life.

The position of the human subject is such that special provision needs to be made for the protection of the ovum during the period when its existence purely from a mechanical standpoint is precarious. If this theory has any basis of fact in it one can readily see that any deviation from normal blood (such as is found in syphilis) would have a profound influence on the developing ovum.

By way of a summary let us define menstruation as a function established to meet the biological requirements of fertilized ova.

The author's references will appear in her reprints.

An Analysis of Twenty-Six Extrauterine Pregnancies*

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It is with an apology that I venture to add this brief analysis to the already overburdened literature of ectopic gestation. There are, however, in this small series of cases, interesting observations which seem to me to be well worth recording.

CAUSES OF ECTOPIC PREGNANCY.

Conditions giving rise to primary sterility are no longer held to be the most important factors in the causation of ectopic gestation. Through the aid of the Rubin apparatus, we (1) have found through studying a large number of cases, that almost fifty per cent. of these women have nonpatent fallopian tubes—a condition precluding the possibility of pregnancy in any form.

A. J. Rongy (2) found that in his series of one hundred cases, seventeen women had not previously been pregnant. In H. F. Lewis's (3) series of one hundred and sixty-eight cases, only sixteen women gave a history of primary sterility for five years or more. In a study of one hundred and seventeen cases, Foskett (4) observes that twenty-seven patients had not previously been pregnant. Averaging these figures, it is found that approximately fifteen per cent. of the patients in whom ectopic gestation exists have not previously been pregnant. McKenzie, cited by Schumann (5), gives the same ratio in a series of one hundred and fifty cases. In our series of twenty-six extrauterine pregnancies only two patients had not previously been pregnant.

The large number of ectopic cases in which there have been one or more abortions is striking, especially when it is remembered that the statistics are taken from hospitals situated in large industrial centres, where there is a large proportion of induced abortions with resultant adnexal disease.

In Hartman and Bergeret's (6) reported cases, of the one hundred and forty-nine patients who had previously been pregnant, forty-eight had had at least one abortion. In Foskett's (4) series of one hundrèd and seventeen cases, about one third of the patients had had previous abortions. About one half of our patients had had previous abortions, many of them admittedly induced. Abortions and their sequelæ seem a more common cause for the development of ectopic pregnancy than venereal diseases. C. M. Enchols (7) believes that the increase in ectopic pregnancies is not due to an increase in venereal diseases, but rather to induced abortions and low-temperature vaginal douches undertaken for birth control. M. O. Magid (8) ably contends that a spreading endocervicitis is at the root of the pelvic disease that causes extrauterine pregnancy.

The following conditions bearing on etiology were found in our series: Previous ectopic gestation, one; ovarian cyst on the affected side, one; induced abortions, four; spontaneous abortions, nine; previous inflammatory conditions of the adnexa not caused by induced abortions, three; previous operations on the lower abdomen with some adhesions, one.

PATHOLOGICAL CONDITIONS.

All pregnancies in this series were tubal, either isthmial or ampullar, two thirds being on the left side. Eight were unruptured with severe intraabdominal bleeding, thirteen were tubal abortions, with hematoceles, two being badly infected; the remaining five were operated on before rupture. One of these five furnished a beautiful specimen of a three months' fetus in the unruptured tube. One patient had a coexisting intrauterine pregnancy which was barely suspected at the time of operation. The case is sufficiently interesting to deserve recording.

Case I.—Mrs. M. F., aged twenty-three, married four years, the mother of one child, had had previously an induced abortion. She entered the hospital on September 28, 1919, in a state of shock. An immediate laparotomy showed a ruptured ectopic pregnancy with a large quantity of blood in the peritoneal cavity. The uterine body was large and soft, betraying the possibility of a coexisting intrauterine pregnancy. The patient made an uneventful recovery and left the hospital on the fifteenth day. A vaginal examination prior to her discharge from the hospital still further increased our suspicion of a coexisting intrauterine pregnancy. As the woman was not bleeding, she was sent home with instructions to return in two weeks for observtaion. She reported to the gynecological clinic on October 31st with profuse vaginal bleeding. Examination showed a large uterus, a soft and patulous cervix, and an ovum presenting at the internal os. She was put to bed and the uterus was emptied on the following morning.

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*From Dr. J. C. Hirst's Service at the Mt. Sinai Hospital, Philadelphia.

Cases of simultaneous tubal and uterine pregnancy are extremely rare. Neugebauer, as quoted by M. F. Raunat (9), collected in 1913 two hundred and forty-three cases, one hundred and seven of which were published in the eighteenth and nineteenth centuries and the remaining cases from 1901 to 1913.

When the ovum develops in that part of the tube which traverses the uterine wall, the condition is called interstitial pregnancy—a very rare condition. When it is lodged in the constricted portion of the tube, it is called isthmial pregnancy. When it develops in the outer third of the tube, it is called ampullar pregnancy. When it is expelled from the fimbriated extremity of the tube without rupture of the latter, the condition is called tubal abortion. This process is always accompanied by dribbling of blood from the free end of the tube into the peritoneal cavity, creating a large hematocele, usually in the pouch of Douglas, where it can be felt readily by vaginal examination.

Tubal abortion is frequently accompanied by severe hemorrhage, and cannot, clinically, be differentiated from rupture of the tube. Rarely this mass of blood may become absorbed, more often the hematoceles become infected and form the most extensive and destructive abscesses.

When the overdistended tube ruptures, and the ovum is discharged into the peritoneal cavity, or, as occurs rarely, into the layers of the broad ligament, the classical symptoms of sudden pain, shock, and, occasionally, tragic death, present themselves.

How often rupture of the tube terminates fatally is a matter of conjecture. Polak (10), who does not operate in these cases until the patient has recovered from shock incident to hemorrhage following the rupture, places the mortality at one third of one per cent. But the patients who come under his observation are those who have survived the initial shock, as evidenced by the lapse of time between the rupture of the tube and the admission of the patients into the hospital.

What about those patients who die before the correct diagnosis is made, and whose deaths are wrongly attributed to ptomaine poisoning, acute indigestion, angina pectoris, etc.?

E. A. Schumann, in his classical monograph on extrauterine pregnancy, analyzed Parry's statistics of five hundred cases in which one hundred and seventy-four patients, or thirty-two per cent., perished from hemorrhage following rupture. These statistics refute Hunter Robb's dictum that "the hemorrhage *per se* is rarely, if ever, the sole cause of death." Oastler (11) draws these conclusions:

1. Ectopic pregnancy occurs about as often on one side as on the other.
2. Tubal abortion is most common.
3. Double ectopic pregnancy is very uncommon.
4. The interstitial form may push its way into the uterus and continue to grow.
5. Ectopic pregnancy may occur twice on the same side, because of a failure to remove the whole tube at the previous operation.

When the fertilized ovum becomes implanted in the tube it is destined to early destruction, usually within the first six weeks, rarely after three months. The retention of the ovum in the tube following its death is called a tubal mole.

DIAGNOSIS.

Our records show no single symptom or physical sign common to all cases in this series. An attempt on the part of the tube to expel the contents produces colicky pains on the affected side. This "unrest" on the part of the tube, as J. O. Polak (10) describes it, is transmitted to the uterus, inducing uterine contractions and bleeding. The onset of these symptoms is usually after a missed period, several days after the date of the expected menstruation. The uterus is somewhat enlarged, because it contains a decidua prepared by Nature for the reception of the ovum which failed to reach its destination.

Extreme tenderness with or without a palpable mass is the most constant physical sign in unruptured ectopic pregnancy, and its association with the above mentioned symptoms often led us to a correct diagnosis. We believe that the existence of exquisite sensitiveness to the palpating finger is more important in the diagnosis of unruptured ectopic pregnancy than the finding of a palpable mass, in view of the fact that the latter often proves to be nothing more than an enlarged or cystic ovary. However, a rapid increase in the size of the mass, even in the absence of extreme tenderness, may be accepted as almost pathognomonic of ectopic pregnancy. This rapid increase in size of the mass is not due to a phenomenal growth of the ovum, but rather to extravasation of blood into the tube. This extravasation of blood into the tube usually causes death of the ovum which produces greater uterine bleeding and the expulsion of the decidua for which there is no further use. This is often mistaken for uterine abortion.

An exploratory dilatation and curettage in obscure cases may be of some value, especially when a competent pathologist is willing to cooperate with the operator. In one case we removed through a preliminary dilatation and curettage what appeared to us a degenerated ovum. Pathological examination, however, showed it to be purely decidual tissue. In cases of advanced extrauterine pregnancy, that is of two or three months' duration, the decidua may be eight by four centimetres (5).

We cannot agree with Dr. N. S. Heaney (12) who advocates the advisability of an exploratory vaginal incision in doubtful cases. The laparotomy is subsequently complicated by infection with increased mortality.

Contrary to the general belief among medical men, the majority of ectopic pregnancies never present the classical symptoms of rupture. Most of them end in tubal abortion, which rarely gives rise to the severe internal hemorrhage that marks the rupture of the tube. The severity of the symptoms in ruptured ectopic depends upon the quantity of blood lost, not merely upon the rupture of the tube. It is, therefore, often difficult to diagnose definitely an early rupture with slow bleeding. In these cases we have found repeated blood examinations of great value. The gradual fall in the red cell count and hemoglobin indicates internal hemorrhage.

CASE II.—Mrs. S. S., aged twenty-eight, admitted to the wards of the Mt. Sinai Hospital on March 9, 1921, had one child. She had aborted spontaneously two years ago. Menstruation had always been regular, the last missed period being two weeks ago.

Several hours prior to her admission she began to complain of sharp pain in the right lower quadrant of the abdomen. She was sent in by her family physician with a diagnosis of acute appendicitis. Vaginal examination revealed a slightly enlarged uterus, and exquisite tenderness in the right tuboovarian region wih considerable resistance in the right lateral fornix; but no definite mass could be palpated. The first blood picture, at 9 p. m., was as follows: Hemoglobin, sixty per cent. (Sahli); red blood corpuscles, 3,370,000; white blood corpuscles, 10,000. At 10 p. m. the blood picture was hemoglobin, fifty-five per cent.; red blood corpuscles, 3,160,000; at 12 p. m., hemoglobin, fifty per cent.; red blood corpuscles, 2,500,000; and at 2 a. m., hemoglobin, forty-six per cent.; red blood corpuscles, 2,270,000.

Though the woman still showed no symptoms of shock, it was evident that she was bleeding internally, as no other condition could explain the gradual reduction in the red cells from 3,370,000 to 2,270,000 with a concomitant fall in the hemoglobin from sixty per cent. to forty-six per cent. in five hours. I operated on her at four o'clock that morning, and found a rupture of the right tube with considerable free blood in the peritoneal cavity. The tube and appendix were removed and 500 c. c. of normal salt solution were given intravenously. The patient had an uneventful convalescence.

A high leucocytosis is the exception rather than the rule in extrauterine pregnancy. In one of our cases the leucocyte count reached 24,000 with a polymorphonuclear count of eighty-eight per cent.. There were tenderness and rigidity in the region of the appendix. Pelvic examination gave no positive evidence of ectopic gestation. The patient's menstrual history was most misleading. The preoperative diagnosis was acute salpingitis with involvement of the appendix. The actual condition found on operation was a tubal abortion.

TREATMENT.

As long as it is impossible to foretell how soon the hemorrhage may prove fatal in any given case, I believe it is proper to operate without delay regardless of the state of shock. The latter can easily be combatted during the operation by intravenous salt solution, which may later be supplemented with blood transfusion. J. O. Polak (10) defers operation until the patient has recovered from the shock incident to hemorrhage following rupture. A. J. Rongy (2) followed the same course until he saw two women die without surgical aid. He then modified his course of treatment considerably.

The practice of some surgeons to remove the ovary with the tube in order to hasten the operation is not good judgment. A patient of mine lost the only ovary she had at the hands of one of our most prominent surgeons. It takes only five minutes longer to remove the tube alone and suspend the ovary by suture of the infundibulopelvic ligament. Two of our patients required blood transfusion to combat the marked anemia. In this series of twenty-six cases we had no mortality.

CONCLUSIONS.

1. Primary sterility is not an important factor in the etiology of ectopic gestation.
2. Abortion, especially induced abortion, is a potent factor in the causation of extrauterine pregnancy.
3. Only thirty-three per cent. present the classical symptoms of ruptured ectopic.
4. Exquisite sensitiveness of the unruptured tube furnishes the most valuable sign of ectopic pregnancy.
5. A rapid increase in size of a tuboovarian mass, coupled with marked tenderness, is pathognomonic of extrauterine pregnancy.
6. An exploratory curettage may be of value in the diagnosis of this condition.
7. Frequent blood examinations may be of some value in cases of slow bleeding.
8. Operate immediately and combat shock by intravenous injections of salt solution and blood transfusion.

The author's references will appear in his reprints.

The Use of Phloridzin in the Early Diagnosis of Pregnancy*

By ALFRED M. HELLMAN, B.A., M.D., F.A.C.S.,
New York.

A sure, safe and simple method for the early diagnosis of pregnancy would, it seems to me, be a welcome addition to our diagnostic armamentarium. The diagnosis of pregnancy at its onset might prove of value from a medicolegal point of view; also for an early interruption of the pregnancy where such interruption is indicated. Naturally, the woman wants to know as soon as possible, perhaps because she merely wants to know, or possibly to help her in deciding some important step, such as going on an extended trip or moving into larger quarters.

The Abderhalden test has rightly fallen into disuse because it requires complicated laboratory methods, and even then is far from reliable. The precipitation of red blood corpuscles is likewise not diagnostic.

That there is a certain amount of need for early diagnosis is evidenced by a study of the literature. Several articles have appeared recently in which decreased sugar metabolism during the early months of pregnancy has been discussed. This has been done chiefly by feeding excessive quantities of glucose to the patient and making elaborate quantitative tests of the blood sugar.

A. W. Bauer (1) asserts that, although artificial glycosuria induced by the ingestion of glucose does not furnish a differential diagnosis between extrauterine pregnancy and tumor of the adnexa, its value must be recognized for the early diagnosis of pregnancy. His method was to test the urine and blood six times at ten minute intervals and twice at thirty minute intervals following the ingestion of excessive quantities of glucose.

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*Read before the Lenox Hill Hospital Association.

Welz and VanNest, of Detroit (2), reported on seventy-one cases of early pregnancy in which glucose was given per os to produce glycosuria. They concluded that glycosuria was of no prognostic importance in pregnancy but of considerable diagnostic value up to the twelfth week.

Kamnitzer and Joseph, working in Berlin, have tried to show that such a glycosuria can be artificially produced in the early months of pregnancy by the intramuscular injection of phloridzin. In the non-pregnant such an injection should not produce glycosuria, nor is it likely in those pregnant over twelve weeks. During the first three months, glycosuria should appear. It is the technic of these men that I have used and which I shall explain here with case reports and results.

Kamnitzer and Joseph found that the test was most reliable when one c. c. of a two per cent. solution (0.002 g. or 3/100 gr.) of phloridzin was used. The preparation that I have employed is supplied in one c. c. ampoules which contain 0.002 gram (3/100 grs.) of phloridzin and 0.001 gram (3/200 grs.) betaeucaine hydrochloride. An intramuscular injection should be given in the morning when the stomach is empty. Before the injection, the patient urinates and then drinks 200 c. c. (six ounces) of water, or tea or coffee without milk or sugar. If the urine, which was passed before the injection was made, reduced Nylander's solution on being boiled and allowed to cool, the phloridzin test should not be continued. After the injection the urine is passed three times at half hour intervals and each time tested with Nylander's solution. At the end of the first half hour the patient is again given 200 c. c. (six or seven ounces) of the bland fluid.

If the urine passed after the injection of the phloridzin reduces Nylander's solution the patient is supposedly pregnant.

Since such drugs as antipyrine, salicylates, saccharin, chloral hydrate, camphor, chloroform, hypophysis extracts and adrenal preparations sometimes give a positive Nylander test, it is best to see that none of these drugs have been used.

I have made the test twenty-four times on twenty-three patients. In seventeen cases where the tests were negative fifteen patients were found not pregnant but two were later found to be pregnant. In the seven cases giving positive results the patients were all pregnant. I present below my interpretation of the two cases with negative tests in which the patients were pregnant at the time the test was made.

Case I.—Mrs. M. R., aged twenty-two, had stopped nursing her baby early in January, 1923, and had menstruated on January 5th and February 2, 1923. When I examined her on March 5th I was unable to decide as to the existence of pregnancy, so on March 9th I made the phloridzin test which was negative. By March 29th I was convinced of the existence of pregnancy by my vaginal examination, so on April 6th I made another test which was positive. The course of events proved this to be correct. This can be explained in only one of two ways. Either the test was done too early or the case will have to go into the group where the test remains unreliable or unsatisfactory.

Case II.—Mrs. F., aged thirty, denied the possibility of pregnancy as she had been sick with influenza and away from her husband for some time. For over two months she had bled every two weeks for several days at a time and quite profusely. A vaginal examination led me to tell the patient that I suspected pregnancy, but as on the next day the phloridzin test was negative, I felt that I must be dealing with a soft bleeding myoma. On April 5th I operated, but before starting the intended laparatomy I did a curettage and removed large amounts of degenerated placenta and did not have to do a hysterectomy at all. In this case the test may have been negative, despite the presence of pregnancy, because of the death of the fetus, as the pregnancy had advanced more than twelve weeks, or the case may also belong to that ground in which the test will remain incorrect.

Test No. 1—Mrs. L. K., aged forty-one. Menses always regular. Last menses August 24th. Very stout, examination difficult. October 14th, test negative. Because family physician feared to allow a possibility of pregnancy to continue, I curetted October 17th and found the uterus empty.

Test No. 2—Mrs. R., aged forty-four. Always regular. Last menses December 11th. Test made January 14th was negative. Menses appeared next day.

Test No. 3—Mrs. F., aged twenty-nine. Last menses November 22nd. Physical examination showed that she was definitely pregnant. Test January 21st, positive in one hour.

Test No. 4—Mrs. H., aged twenty-four. Last menses December 17th, and then only one day. January 28th, thirty minutes after the injection of phloridzin, the Nylander test was positive. Patient was pregnant.

Test No. 5—Miss B——z, aged thirty-one. Last menses six weeks previous. She had on a previous occasion gone over six months without menstruating but at that time there was no cause for a suspicion of pregnancy. February 23rd, test positive. Later developments proved that she was pregnant.

Test No. 6—Mrs. L——n, aged thirty-three. Not overdue but suspected that she was pregnant. As she was contemplating a trip abroad she was anxious to know. The test was negative and five days later and before sailing the menses appeared.

Test No. 7—Mrs. M——h, thirty-seven. Two weeks overdue. Test positive. Patient pregnant.

Test No. 8—Mrs. K——t, aged thirty-two. Always irregular. Menses four days overdue. Test February 24th negative. Menses appeared two days later.

Test No. 9—Mrs. M. M., aged thirty. Menses frequently absent for months at a time. Two weeks overdue. Test positive. Patient pregnant.

Test No. 10—Mrs. G——y, aged forty-four. In 1917 I removed a left ectopic. Last menses December 19th to 24th. Uterus seemed enlarged. Test made the next day was negative. March 4th menses appeared. She was greatly disappointed as she was anxious to have a child.

Test No. 11—Mrs. H——n, aged forty. Just over period. Test negative. Patient not pregnant.

Test No. 12—Mrs. M. R., before detailed.

Test No. 13—Mrs. L——v, aged thirty-six. Six children. Therapeutic abortion January 13th. Only menses since then on February 15th. Test March 20th was negative. Menses appeared one week later.

Test No. 14—Mrs. B——r, aged thirty. One child. Right cystic ovary removed November, 1921. Last menses February 17th. Negative test on March 26th. Patient was not pregnant.

Test No. 15—Before detailed.

Test No. 16—Mrs. R is the same patient as test No. 12 where the test was negative March 9th and positive April 6th and the patient was pregnant.

Test No. 17—Miss B——t, aged twenty-four. Last menses March 5th and 6th. Test April 14th, negative. Menses set in April 23rd.

Test No. 18—Mrs. Z. Hyperthyroid case. Last menses February 23rd. Always delayed but never as much as this time. Test April 24th, negative. Menses appeared April 27th.

Test No. 19—Mrs. H. F., aged twenty-nine. One child. Menses always delayed two to three weeks. Last menses February 27th. Test May 8th, positive. Patient was definitely pregnant.

Test No. 20—Mrs. H. L., aged thirty-five. Menses as a rule every twenty-eight to thirty days lasting three days. Last menses March 28th. May 11th and 12th slight bleeding. Test May 16th, negative. Patient is definitely not pregnant.

Test No. 21—Mrs. D. F., aged twenty-one. One child nine weeks ago—child died when half hour old so there was no nursing. Menses appeared six weeks ago, the only time since labor. Test May 28th, patient is not pregnant.

Test No. 22—Dr. L.'s patient, aged twenty-four. Married one year. Menses as a rule regular. Now absent two and a half months. Test negative. Two weeks later menses appeared.

Test No. 23—Mrs. M. G., aged thirty-one. One child. Last menses was one week too early when it appeared April 19th. Thin, easily examined, uterus very small. June 1st test negative. Not pregnant.

Test No. 24—Wife of Dr. S., aged twenty-two. No menses for one and a half years during which time she gained forty pounds. Married six months. Maturin test June 2nd. Patient is not pregnant.

CONCLUSIONS.

Healthy, nonpregnant women give negative results with the phloridzin test. Women pregnant less than twelve weeks will as a rule, though not invariably, give positive results with the test. The number of cases here tested is too small to draw definite conclusions or give percentages. Certainly there is something in the test and it deserves further study.

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76 EAST SEVENTY-NINTH STREET.

Pus in the Pelvis of Women

By G. PAUL LA ROQUE, M.D., F.A.C.S.,
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Among seventeen hundred women studied and operated upon by myself for disease of pelvic organs between seventy-five per cent. and eighty per cent. presented signs, symptoms and visible pathology of inflammatory disease of the uterus and adnexa. In between seventy per cent. and seventy-five per cent. of the inflammatory cases operation was performed essentially for such lesions as lacerated cervix, displaced uterus, tumors of the uterus and ovaries, retained material following miscarriage, and for such tube disease as old adhesions and hydrosalpinx in which active and gross suppuration of tubes was not present at the time of operation. These are not included in this report.

The total number of suppurative cases was five hundred. In three hundred and thirty the pus was confined to the tubes, uterus, and ovaries, and in one hundred and seventy there was walled off suppurative peritonitis in the form of pelvic abscess. We have been careful to exclude every case which, after the abdomen was opened, presented any doubt even to a skeptic at some distance from the table, as to the suppurative nature of the disease. Only and all cases of old fashioned, dyed-in-the-wool pus tubes, suppurative ovarian cysts and pelvic abscesses are included. The pathological picture is too familiar. Pus was present in and about the organs, the peritoneum red, swollen, edematous, and the organs lightly or tightly adherent to each other and to bowel and omentum. The uterus and tubes were the organs primarily involved; no case of appendiceal abscess is here included.

The patients were all acutely sick upon admission to the hospital, suffering abdominal pain of variable severity, tenderness, muscular rigidity over the lower and often the upper abdomen, palpable masses in the pelvis, fever, prostration, and other signs of acute illness from pelvic organ suppuration with peritonitis. Several years ago a study of records showed that all women upon whom we had operated for suppurative disease of the pelvic organs invariably presented, as a part of the pathology, preexisting lesions antedating inflammatory disease.

Of the women in this series with suppurative disease eighteen per cent. had previously existing fibroids of the uterus; forty-two per cent. had ovarian cysts; approximately fifty per cent. had displacement of the uterus; fifteen per cent. to twenty per cent. had lacerated cervix; in several cases there were suppurating hematomata following ruptured tubal pregnancy, and in three suppurating tubes complicating uterine pregnancy.

More than half of the women in this series presented additional surgical pathology apart from that in the pelvic organs. In fourteen the pelvic organ pathology had caused ulceration of the bowel necessitating bowel suture; more than three hundred had definite coincidental appendicitis which of itself needed operation; some had gallstones; some hernia; over a hundred and fifty required operation upon cervix and perineum and rectum; in five per cent. of the women there was present serious secondary anemia ranging from twenty-one per cent. to fifty per cent. hemoglobin; many cases presented heart and kidney disease, obesity, glycosuria and other nonsurgical coincidental affections.

Among the total five hundred women there were four deaths, a mortality of four fifths of one per cent. In no case has operation been postponed more than a reasonable period after admission to the hospital for preparatory treatment and the opportune time. Only one patient has died without operation. This was a woman moribund, with postabortional sepsis, and who died twenty hours after admission. All deaths from all causes are counted. All were in women in whom suppurative disease complicated fibroid and cystic disease of the uterus and ovaries. They are recorded here as deaths from operation for inflammatory disease and also in a recent report of six hundred hysterectomies and ovariectomies for benign tumors.

The fatal cases were as follows:

Case I.—9-1425. The patient was fifty years old, with a left ovarian cyst of large size and of years' duration, and had been acutely sick several weeks and rapidly progressing toward death from suppuration. Upon examination there was found in the left lower abdominal wall an area of suppuration pointing through the skin. Under light anesthesia an emergency palliative puncture of the abscess gave exit to gangrenous cyst material and fecal matter seen to come from the point of adhesion and ulceration of the cyst and sigmoid. She died a few days later of general sepsis. This was in 1909.

Case II.—15-2426. The patient was thirty-five years old, with pelvic abscess, large suppurative ovarian cyst ulcerated into the sigmoid, single pus tube, and pulmonary tuberculosis. Operation consisted of removal of the ovarian cyst and left tube, suture of hole in the sigmoid, appendectomy, and drainage of pelvic abscess. The patient died six weeks later of septic exhaustion and pulmonary tuberculosis. This was in 1915.

Case III.—16-2556. The patient was twenty-five years old with double pus tubes, cystic ovary and pelvic abscess, all acute and erroneously believed to be appendicitis or tubal pregnancy. Hysterectomy, ovariectomy, appendectomy, and drainage of pelvic abscess were performed a few hours after admission, but she died twenty-four hours later of septic shock. This was in 1916.

Case IV.—21-3838. This was a woman thirty years old, three weeks sick with postabortional double pus tubes, pelvic abscess, and cystic ovary. Three days later with signs partially subsided double salpingectomy, partial hysterectomy, ovariectomy and appendectomy were performed. She died the fourth day of septic kidney breakdown. This was in 1921.

In the five hundred cases here reported the women have welcomed operation as a last resort. The clinical story is that of recurrent attacks or alternate remissions and exacerbations of symptoms, periods of encouragement that they may be better, discouragement that for some usually assignable reason they have had a relapse, and finally despair of being able to be cured with "the knife."

With the clinical story so familiar it would seem quite superfluous to urge all women hastily to operation by the threat of impending death from the disease. The advantages of earlier operation are incident to the cure of suffering, prevention of extension of disease, prevention of the necessity for technically more difficult, more radical and more dangerous surgery, on account of complicated pathology in women older and less healthy. Reasonably early operation is conservative surgery; late operation calls for radical surgery, and though it is clearly demonstrated that the longer the patients wait the more organs will have to be removed, and though even for ancient and extensive disease the operation is not likely to be fatal, the disease may terminate fatally in spite of operation in a few cases.

The urgency of immediate operation is an important question. Women rarely receive operation for the first spell of symptoms caused by pelvic inflammation save as a result of an erroneous diagnosis. The great majority of cases of this series were of long postponed operation for complete subsidence of symptoms which refused to subside. Following reasonably long delayed operation and proper preliminary treatment upon previously unrecognized twisted ovarian tumors, ruptured tubal pregnancies, and appendicitis; and following reasonably prompt operation upon pus tubes erroneously believed before operation to be appendicitis, tubal pregnancy, or twisted ovarian cysts, there is low mortality. Lack of conspicuous differences in the results following both plans suggests that after a reasonable wait for sizing up the situation, the time as calculated in hours and days for operation upon women for pelvic disease is of minor importance, as compared to such other factors as the condition of the woman and her abdomen, the preliminary treatment, method of procedure, technic of operation and postoperative treatment. Emergency operation is certainly not needed and is dangerous. A woman too acutely sick to be moved to a proper hospital is too sick to be attacked and will not be operated upon by a surgeon of good judgment. The abdomen of a woman acutely sick with lower abdominal disease may invariably be pacified by morphine and local hot or cold applications and the woman quickly placed in condition for transportation and operation. More than half the women in this series of cases were brought to Richmond from homes in rural districts and towns throughout Virginia and North Carolina. In no case did the trip cause harm; on the contrary, the patients usually seemed better upon arrival at the hospital than before leaving home (morphine administered to make the trip easy helped in other ways).

We have never treated these cases by vaginal incision or "puncture of the *cul de sac*" even for temporary drainage. I have never seen a patient die for want of simple drainage, and but few in whom there was reasonable ground for the belief that puncture of the *cul-de-sac* could have been of sufficient benefit to justify the operation. Once in a while a puncture of the *cul-de-sac* may be followed by the discharge of what appears to be a large quantity of pus, but as a rule the quantity removed is quite small. On the other hand in a large proportion of the cases (between 11.7 per cent. and 25 per cent.) the operation reveals an error of diagnosis or the pus is not accessible. The discovery of blood, an ovarian cyst, tumor of the uterus, or of fecal matter will reveal an error of diagnosis resulting in the necessity for opening the abdomen immediately to remove a ruptured tubal pregnancy, twisted ovarian tumor or some other pathological condition not accessible by the vaginal route and in a woman "too sick for radical abdominal operation."

An added abdominal operation performed as a matter of necessity and urgency upon a woman under these circumstances is a serious danger to the patient. Vaginal puncture, even in the hands of those advocating it, is not intended to be curative but only a temporary benefit in twenty per cent. of the cases, and there is at least six per cent. immediate mortality (1). We have in a large number of cases acted with entire satisfaction upon the theory that patients who could be benefitted through vaginal puncture are benefitted equally by the proper application of the modern treatment of peritonitis; by avoiding purgation and solid food; by the administration of large quantities of water, usually by mouth, but in desperate cases by hypodermoclysis; by the administration of sufficient doses of morphine to give the patient complete rest and pacification of peristalsis.

This standard treatment, endorsed by the great majority of American surgeons at the present time, has been practised in all cases accompanied by fever, great pain, and a distended rigid abdomen as a preliminary measure to operation. Under this treatment we have seen so many easily recognized inflammatory masses of large size completely or almost completely disappear and have never seen a patient die, that it is not easy to see any advantage in vaginal puncture. Though vaginal puncture is made and pus flows we are not justified in hastily concluding that the patient would have died if she had not been punctured. It is easier for surgeon, bystanders, and members of the family to believe this than it is to prove it. With the present day treatment of pelvic peritonitis it would seem that there is scarcely any real need for this procedure. It is often more dangerous than the disease.

A systematic, thorough, operative procedure is called for. In nearly all cases after the woman is anesthetized the final bimanual vaginal examination is made. After cleansing the vagina of gross filth, the iodized cervix is well dilated and a dull spoon curette introduced for exploratory purposes and to remove loose material. In years gone by we usually scraped about in the interior of the uterus. We have never felt any reason to believe that scraping did any good. Curettage of the uterus is now known to be a procedure of such great danger in the presence of suppurative disease that we consider it a gynecological error.

If the cervix was torn and hysterectomy was not necessary we repaired the cervix if it was not much reddened or infected; if badly infected, or if hysterectomy was to follow, we amputated the cervix with the electric cautery knife. This practice was not pursued in the earlier cases and some of the women were annoyed by purulent vaginal discharge after operation. Since we have had satisfactory electric cautery knives we have employed this method of destroying the cervix and the women have had a dry vagina after hysterectomy. We feel quite strongly that infected torn cervices should not be neglected. Such lesions need treatment independent of abdominal disease.

After dealing with the cervix, lesions about the vagina, vulva and rectum are examined and dealt with accordingly. The abdomen is usually opened by a vertical incision at one side of the middle line. In exceptional cases of excessively fat or greatly overstretched and prolapsed abdominal walls, or of large fixed masses, an elliptical crosscut of the abdominal wall seemed to give more easy access to the pelvis and left a good abdominal wall.

Before the pelvic organs are touched or closely inspected, the gallbladder, bile ducts, and stomach are examined; usually both kidneys are felt to see if one may be absent and to detect lobulated kidney and palpable calculi. Inguinal and femoral herniæ are removed by the intraabdominal method and umbilical herniæ are excised by prolongation upward of the vertical incision. The appendix, unless incorporated in the pelvic pus, is removed before the pelvic organ work is done; if suppurating, appendectomy is reserved until the last. In approximately twenty-five or thirty of the cases here reported, appendectomy had been performed by other surgeons before the patients came to us for pelvic disease. We have also operated upon women for appendicitis after they had previously had pelvic disease operated upon by other surgeons. Three or four of the women in this series of five hundred seemed too sick to take the extra three minutes for normal appendectomy.

By proceeding in this manner and curing the non-pelvic lesions before approaching the pelvic disease, the woman is cured of all her disorders, thus being given more nearly one hundred per cent. efficiency of operation; second operations for appendicitis, hernia, lacerated cervix and perineal tears are forestalled, and the operative procedure most likely to be productive of shock is reserved for the last, so that the patient may be put into a warm bed without delay upon the treatment for shock. In dealing with gallstones, however, we have usually, but not by any means invariably, deferred operation upon the gallbladder. In fourteen cases we were compelled to suture openings into the bowel at points of dense adhesions and in one case the bowel had been previously punctured by a gynecologist while puncturing an abscess in the *cul-de-sac*.

One or both tubes were removed in all but one of the five hundred cases here reported. In between eighty-five per cent. and ninety per cent. of the cases both tubes were the seat of suppuration at the time the abdomen was opened. One or the other was frequently found to be enormously enlarged and distended, while the opposite tube was much less extensively diseased. In some of the earlier cases we made efforts at conservatism and removed only one tube. We soon found, however, that while this was preservation it was not conservatism. Some of these women continued to suffer from inflammatory disease, a few returned to us for the second operation, and doubtless others were operated upon elsewhere. Conservatism of healthy structures is quite different from the preservation of diseased ones. For nonsuppurative disease in women of childbearing age we have seldom removed both tubes under any circumstances; but for suppurative disease of such severity as in the cases included in this report, both tubes have been hopelessly diseased in approximately ninety per cent. of the cases.

For the past five years I have invariably removed at least the upper part of the uterus in patients from whom both tubes had to be removed. Close examination of the uteri after removal and cutting through at various places has shown a large proportion of them to be the seat of small though easily obvious abscesses throughout the uterine muscle. Convalescence is much smoother and in my experience the mortality is less; the cure of symptoms is more complete, and postoperative leucorrhea less often noted following partial hysterectomy, when both tubes need removal, than after leaving the inflamed uterus which can have no function.

We have performed hysterectomies on four hundred and sixty of the five hundred women. Removal in one piece of both suppurating tubes and the intervening portion of the uterus at some point between the tube attachment and bladder, makes easy complete covering of all raw surfaces by a continuous stitch from one end to the other of the broad ligament over the uterus.

Subtotal is the type of hysterectomy called for in the great majority of cases showing extensive suppurative disease in which it is necessary to remove both tubes. Preceding hysterectomy in women with large cystic, torn, and infected cervices, cautery amputation of the cervix has proved of great value in destroying the diseased cervix and preventing postoperative vaginal discharge. The small remaining piece of thoroughly cooked cervix after cautery amputation of the cervix from below and subtotal hysterectomy from above, serves nicely as holding material to which the round and broad ligaments may be sutured for suspension and to cover all raw surfaces with peritoneum. This combination of cautery amputation of the cervix and subtotal hysterectomy has so far, in more than one hundred cases, served quite satisfactorily for the cases to which total hysterectomy is advocated by many. Menstruation is not stopped by this method. I have performed the complete hysterectomy from above in a few cases of this series without fatalities and am open to conviction that the total operation from above is no more dangerous and more completely curative than subtotal hysterectomy preceded by cautery amputation of the cervix.

Ovariectomy has been employed in slightly more than fifty per cent. of the women in this series for ovaries and cysts hopelessly entangled in inflammatory exudate, dense adhesions or obviously internally infected; and in cases gangrenous with torsion of the pedicle.

In no case have both ovaries been removed from any woman under forty-five years of age unless all ovarian tissues had been totally and hopelessly destroyed by inflammatory disease and cysts. In approximately ninety per cent. of the total cases we have found it practicable to save some portion of at least one ovary and avoid the production of artificial menopause. This practice has thus far been satisfactory and while a few women have failed to get perfect relief of symptoms and a small number have had second operations after a year or so, the number has been so small and the satisfaction to the women has been so great that I am satisfied to continue the purpose of sane conservation of ovarian tissue in young women. In women beyond the age of forty-five no attempt to conserve ovaries was made, unless they were unquestionably normal.

Concerning the necessity for drainage after abdominal operation, cases of this kind are fewer and fewer as years go by. Some years ago the standard practice was "when in doubt drain." Today the standard practice is, when in doubt do not drain. The best judgment is that which gives the highest standard of efficiency and the fewest doubts. In the earlier cases of this series we placed a gauze drain in a few cases for safety on account of oozing. Surely modern surgery has attained a standard of efficiency sufficiently high in the prevention of hemorrhage during pelvic surgery to secure safety without a pack. The whole question of the necessity for draining in the individual case is answered by the surgeon's success in removing all the diseased tissues giving origin to the pus. The surgeon's part in pelvic inflammatory disease is to remove the suppurating tubes and ovaries and appendix, find and close little ulcerated areas in the bowel, stop all bleeding and cover raw surfaces with good peritoneum. This done a woman who has lived long enough to get pelvic abscess is usually safe with three to five days' modern treatment for peritonitis. They seldom need rubber tubes and gauze packs after the cause has been removed. In this series there were one hundred and seventy cases of pelvic abscesses, thirty-five of which were drained; three of these patients died. All others were closed tight without drainage and all but one recovered.

CONCLUSIONS.

1. Many women acutely sick with suppurative disease of the uterus and tubes recover almost completely without surgical operation. Recovery is hastened by vigorous nonoperative treatment of peritonitis, i. e., ample quantities of morphine and other opiates; local hot or cold applications to the abdomen; absolute and continuous rest; abundance of fresh air through open windows; gastric lavage when vomiting is persistent, restriction of solid food; avoidance of cathartics and enemas; administration of large quantities of water (at least four quarts daily), preferably by mouth; normal saline solution by hypodermoclysis, in certain cases by enteroclysis, and in severe cases by all these routes combined.

2. Immediate operation is never called for; emergency operation should never be performed; every case may without danger wait for operation until at least partial subsidence of fever and pain, flattening and pacification of the acutely sick abdomen; acquisition of some degree of systemic immunity and transportation to a modern hospital; few cases need wait much longer than this; many patients may with

safety be operated upon one or two days after admission to the hospital.

3. No woman with pelvic disease need wait longer than is necessary to "get things fixed" for proper operation. The records show that reasonably early operation is preventive surgery against long preoperative and postoperative invalidism, against extension of disease to the other tube and one or both ovaries, against dense adhesions and ulceration of the bowel, and prevents the necessity of mutilating operations upon the pelvic organs, reparative operations upon the bowels, and of an unnecessary proportion of cases of drainage.

4. Systematic and thorough operative procedures are called for; all disease should be cured at one operation in approximately ninety-five per cent. of cases. Conservation of normal organs is one thing, preservation of diseased ones quite another. No normal tube or ovary should be removed; no diseased one should be preserved. Mortality is lower, convalescence smoother, and cure more complete following complete than incomplete removal of disease.

5. Abdominal drainage following removal of diseased tissue is necessary in less than twenty-five per cent. of one hundred and seventy women with pelvic abscess and in less than ten per cent. of the total number of five hundred women in this series.

6. Postoperative treatment is the same as that for peritonitis; rest, abundant quantities of morphine, normal saline solution by hypodermoclysis, water or soda solution by enteroclysis, at least four to six quarts of fresh palatable water by mouth each twenty-four hours for four or five days, hot or cold refreshing liquid food and beverages when the stomach becomes retentive, gastric lavage for bilious vomiting and the rigid avoidance of drugs, enemas, rectal tubes, solid food and other such stimulants to peristalsis until the abdomen becomes flat, and the patient passes flatus (usually from four to five days or a week depending upon the severity of the disease).

7. The mortality of suppurative disease following operation should not be more than one per cent., the stay in bed rarely longer than two weeks, there should be no excessive postoperative menstruation, no pelvic pain nor purulent discharge.

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835 WEST GRACE STREET.

Importance of Palpation of Pelvic Ureters in the Diagnosis of Abdominal Disease*

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Palpation of the female pelvic ureter is a much neglected method of diagnosis. Max Sänger in 1886 showed that the pelvic ureters could be palpated, but it is easier to palpate diseased ureters. At the New York Polyclinic I had no difficulty in teaching students how to palpate ureters, after they had learned their position by the insertion of catheters. During vaginal examinations there is nothing between the ureter and the finger but the vaginal wall (1). A thickened tender ureter palpated through the vagina frequently will give a clue to a diagnosis in cases in which a diagnosis has not been made. The lower ureter becomes thickened and enlarged in diseases of the kidney; because it takes part in the involvement in the inflammatory process, dilatation also occurs and is the result of infection. Changes in the wall of the ureter are always present whenever pyelitis exists (2).

In mechanical dilatation the ureter is thickened below and dilated above the point of obstruction. The changes in the ureteral meatus seen through the cystoscope described by Fenwick, which he affirmed afforded a clue to the nature of the disease of the kidney, are due to the changes in the lower ureter. Pain in the region of the kidney, radiating to the lower abdomen, genitals, and thighs, is typical of renal or ureteral affections but it is often absent. Abdominal pain not associated with pain in the back and without urinary symptoms is frequent. Pain due to disease of the urinary tract may be intensified in different regions of the body, the explanation of which must be sought in the nerve plexuses and anastomoses with other nerve plexuses, also in the contact of the kidney and ureter with different abdominal organs and the extension of disease from these organs.

The ureter is supplied by the aortic, renal, ovarian, superior and inferior mesenteric, hypogastric, vesical, lumbar and sacral plexuses. These plexuses, anastomose with each other and with all abdominal sympathetic plexuses, connecting the ureter through the nerve plexus with all abdominal viscera.

The anastomosis of the nerve plexuses of the ureteral and uterine plexus explains the reflex pain and bleeding due to ureteritis; anastomosis with the mesenteric plexus explains pain the the gallbladder, stomach, intestines and appendix. With the vesical plexus pain in the bladder and ureters, with ovarian pain in the ovaries, hypogastric pain in the genital tract, renal pain in the kidney, sacral pain in the rectum, pelvic pain in the thigh, and intercostal pain in the abdominal wall, lesions of the kidney and ureter may simulate every abdominal and pelvic disease from gallstones to ectopic pregnancy.

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Hunner (2) diagnosed five hundred cases of ureteral stricture in three and a half years and he concluded that it was the cause of more kidney disease than any other factor, and a frequent cause of unnecessary abdominal operations. Frequently there is no pain referred to the urinary organs, only repeated attacks of epigastric distress and at times fever. Pain may be referred to any organ in the abdomen and to any part of the abdomen.

In lithiasis the position of the stone, whether in the kidney or the ureter, has little bearing on the distribution of pain. A stone in the kidney may cause pain limited to the lower abdomen and vulva, and stone in the lower ureter produce pain in the renal region or high in the abdomen.

Braasch (4) reports that in ten per cent. of the cases operated in by Mayo for stone, there was no definite pain.

Bugbee (5) says: "It is possible to make a diagnosis with the x ray and ureteral catheter in two thirds of the cases. Out of seventy-six cases of calculi in the lower ureter not showing a shadow, twenty-two patients passed calculi.

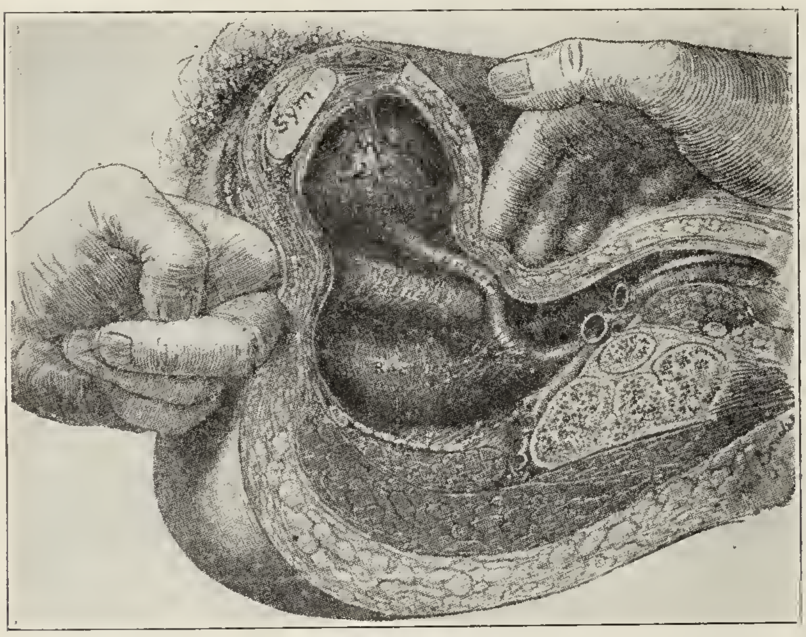

FIG. 1.—Sagittal section of the female pelvis, showing bimanual palpation of lower end of ureter.

Barney (6) reports that in eighteen per cent. of his cases of ureteral calculi, the patients had one or more previous operations and says: "These mistakes were made by skilled surgeons with every facility for arriving at a correct diagnosis." He also says: "Abdominal exploration is sometimes necessary to differentiate between lithiasis and acute conditions of the abdomen. Urine is negative in eight per cent. and the x ray in six to eleven per cent. of cases. The pelvic ureter is always thickened and palpation will give a clue to the diagnosis."

Krestschimer (7) reports that in forty-four and one half per cent. of his pyelitis cases the patients were operated upon for some abdominal condition.

Cecil (8) says that in thirty per cent. of his hydroureter and hydronephrosis cases, the patients had had abdominal operations for the relief of pain, subsequently demonstrated to have been of renal origin.

Green (9), in an article on the stricture of the ureter as an explanation of obscure abdominal conditions, says: "The diagnosis is made by urinary symptoms and by palpation revealing tender spots low down in the broad ligament."

Janes (10) says: "The terminal three inches of a pathological ureter can be felt as a tender tube along the anterior and lateral fornices of the vagina."

In tuberculosis of the kidney frequently the only symptoms present are a dull ache in the lumbar region with frequent urination.

In 1903 Bazy (11) described as diagnostic of tuberculosis of the kidney, the reflex pain on touching the ureteral meatus through the vagina.

Bugbee (12) found that in a large percentage of his tuberculous cases there was stricture, and that a thickened irregular ureter could easily be palpated through the vagina.

Ureteritis due to infections of the cervix is frequently mistaken for cystitis.

In 1886 Sänger (13) reported cases of ureteritis treated for long periods as cystitis.

In an article published in 1920 (14) I said that ureteritis due to lacerations and infections of the cervix, if treated early, will not result in stricture. Bladder symptoms following hysterectomy are frequently due to ureteritis and not to cystitis. Palpation of the pelvic ureter will give a clue to the diagnosis.

TECHNIC OF PALPATION

To palpate the ureter from the ureteral orifices at the trigone to the base of the broad ligaments, to orient the position, imagine a line from a point half an inch in front of the cervix to a point about half way between the lateral border of the cervix and the lateral pelvic wall. The fingers are introduced into the anterior lateral vault of the vagina and counterpressure is made downward through the abdominal wall. Draw the fingers forward, and as the tissues slip through the fingers the ureter is felt as a flattened cordlike body, smaller than a goose quill, displaced in its bed of loose cellular tissue. It can be rolled from side to side under the palpating fingers by moving them toward the broad ligament. Posterior to the broad ligament it is felt above the spine of the ischium covered by peritoneum, by palpating it against the pelvic wall.

Judd (15) advises sweeping the fingers above its location as in pricking a guitar, always from above downward. It may run as high as an inch above the spine of the ischium.

The normal ureter never causes pain on palpation. If diseased, it is enlarged and feels like a hard cord, sometimes as large as a lead pencil or even larger. Palpation brings an intense desire to urinate. It is easy to distinguish a diseased ureter by comparing it with its fellow which is rarely diseased, or if diseased at all, never to an equal extent.

REPORT OF CASES.

CASE I.—U. S., twenty-five years old. Temperature 104°, nausea, epigastric distress, pain and tenderness in region of the appendix. Appendectomy was advised by her physician. Examination by vagina showed the right ureter enlarged and tender. Palpation brought intense desire to urinate. Left ureter was enlarged and tender, but not as large as the right. A diagnosis of pyelitis was confirmed by examination.

CASE II.—M. H., aged thirty-two years, suffered from pain in the left ovarian region which was worse at menses. She was sent for operation. The left ureter was found to be enlarged and tender. A diagnosis of ureteritis due to stricture was confirmed by ureteropyelogram.

Case III.—S. U., reported by Dr. Wells. The patient suffered from acute pain and tenderness in the gallbladder region, with chills, fever, nausea and vomiting, and was sent for gallbladder operation. The right ureter was enlarged and tender and she passed a stone the size of a shoe button after ureteral catheterization.

Case IV.—K., the patient, had a tumor in the right side of the abdomen, which was diagnosed as enlarged gallbladder. There was frequent urination, with blood in the urine attributed to inflamed ureteral meatus. X ray was negative. Right ureter enlarged and tender. Collargol picture revealed soft stone the size of a plum in the kidney pelvis. Large pus kidney was removed with soft stone at operation.

Case V.—D., the patient, was sent to the Polyclinic Hospital by Dr. Wells with a diagnosis of ectopic pregnancy, last menstruation three months previously. She complained of severe pains in the right ovarian region, accompanied by spotting. Uterus was enlarged with a two and a half months' pregnancy, right ureter was enlarged and tender. Diagnosis, pregnancy with ureteritis and pyelitis.

Case VI.—F. S., the patient, twenty-nine years old, was sent with a diagnosis of ectopic pregnancy; last menses two and a half months ago, irregular bleeding with attacks of severe pain in right ovarian region, nausea and fainting. She said the pain felt as if it was in a tube like a banana in her pelvis. Examination revealed a uterus enlarged, softened, the size of a two and a half months' pregnancy. In the left cornu was a hard mass the size of a plum, and a bloody discharge of brownish color from the vagina. The right ureter was enlarged, very tender, and palpation gave intense desire to urinate. There was a cramplike pain in the abdomen with nausea and faintness. Diagnosis, two and a half months' pregnancy in left cornu; ureteritis due to stone.

Case VII.—D. S., aged sixty years, referred with a large kidneyshaped mass on the left side below the ribs extending into the kidney region. Palpation revealed a normal ureter. Ureteropyelogram showed a normal ureter and kidney pelvis. A large sarcomatous spleen was removed at operation.

Case VIII.—J. U., aged thirty-five years. Since the birth of a child three years ago the patient had suffered from indigestion, pain in right abdomen, and frequent painful urination. She had been treated for cystitis, and advised to have appendix and ovary removed. Examination showed the cervix lacerated, eroded, and infected, right ureter enlarged and tender. Diagnosis, ureteritis and cervicitis.

Case IX.—M. P., aged thirty-five years, suffered from an attack of severe pain referred to the right iliac region, with nausea, epigastric distress, and frequent and painful urination. Her physician thought he felt an enlarged appendix. The right ureter was enlarged to the size of a finger, and very tender. Diagnosis, tuberculosis of kidney confirmed. The enlarged appendix her physician felt was a tuberculous ureter.

Case X.—J. R., aged twenty-five years, complained of pain on the right side, indigestion, constipation, and epigastric distress. Appendix, Lane's kink, and right ovary were removed without relief. X ray and urine were negative. Palpation revealed a hard tender mass in the right lower ureter, pressure on which brought intense desire to urinate. Diagnosis of stone in lower ureter was confirmed by examinations.

The author's references will appear in his reprints.

The Significance of Inflammatory Ureteral Stricture in the Female*

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Hunner, in 1916, in a report of fifty cases of ureteral stricture, called the attention of the medical profession to the frequency of this condition in the female. Subsequently, other American observers have from time to time reported instances of this urinary disorder. European urologists, while recognizing the pathological entity, in definite renal infections showing evidences of ureteral obstruction, do not lay much stress upon the nonobstructive type of ureteral stricture.

Gynecologists, without a doubt, are consulted by female patients suffering from urinary tract infections more often than the urologist. Fully half of my own gynecological patients complain of urinary symptoms of varying degrees. It, therefore, seems advisable for one specializing in diseases of women to investigate the urinary tract by the approved methods of cystoscopy and ureteral catheterization. Urinary symptoms may occur from pathological conditions in the kidney, ureter, and bladder. Furthermore, they quite often have their origin outside the urinary tract, and are produced by pathological conditions of the uterus, tubes and ovaries, either from pressure or by distortion of the bladder from inflammatory adhesions.

ANATOMY OF THE URETER

The ureter is a musculofibrous tube connecting the kidney with the bladder; it averages about thirty cm. in length, beginning at the pelvis of the kidney at the level of the second lumbar vertebra, and runs downward parallel to the vertebral column behind the parietal peritoneum, to the brim of the pelvis where it is crossed by the ovarian vessels. It now crosses the common iliac vessels, dips into the true pelvic cavity, enters the broad ligament which it traverses in a downward and inward direction, passes under the uterine vessels, and enters the base of the bladder. In its course through the broad ligament the ureter is closely adherent to the posterior layer.

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The ureter is composed of three coats; mucous, muscular, and fibrous. The mucous membrane consists of transitional epithelial cells of several layers continuous with that of the renal pelvis and bladder. The muscular coat consists of an inner longitudinal and an outer circular coat; it is of the unstriated involuntary type of muscular tissue, and has the function of peristaltic action. The fibrous sheath is composed of a fibrocellular substance that surrounds the ureter and is of especial importance because it gives support and contains the bloodvessels that nourish the ureter.

CLASSIFICATION

Two general groups of ureteral stricture can be made; first, obstructive stricture; second, nonobstructive stricture.

OBSTRUCTIVE STRICTURE.

Obstructive stricture can be defined as an infiltration of the ureter that encroaches upon the lumen in such a manner that dilatation of the proximal ureter and renal pelvis takes place.

Etiology—This type of stricture is frequently produced by primary infections in the kidney of hematogenous origin. Infected urine from the renal focus in its passage downward may set up an inflammatory area in the ureter, or a direct extension through the lymphatic channels may take place from the kidney to the ureter, so producing a secondary inflammatory reaction in that structure. A good example of this type of infection is that of tuberculosis. Other renal infections due to pyogenic organisms may also produce such lesions.

Pathology—Under these circumstances there always occur a hydroureter and hydronephrosis of varying extent, and in some cases pyonephrosis, with impairment of renal function.

Symptoms—These patients practically always have symptoms referable to the urinary tract that are predominant factors. They complain of pyuria, dysuria, hematuria, and abdominal pain. Objectively there are evidences of pyuria and cystitis, and definite signs of renal infection. Cystoscopic examination shows a secondary bladder infection of varying degrees of intensity; the ureters may offer an impassable stricture, or they may allow passage of a small ureteral catheter or bougie. Urine from the infected side shows numerous pus cells and on culture may show the type of bacteria producing the condition. The phenolsulphonephthalein and indigocarmine tests as a rule show an impairment of renal function. In cases of long standing the blood chemistry should be investigated to ascertain the degree of nitrogen retention present. Pyelography is also a great aid in making an accurate diagnosis and to locate definitely the point of stricture.

Treatment—This is clearly defined. When a diagnosis of renal tuberculosis has been made, a nephrectomy is indicated. When other bacteria cause the trouble and in cases where the renal infection is not so advanced that there is serious impairment of function, ureteral dilatation and renal lavage should be instituted, for by the establishment of proper drainage it is truly surprising what improvement will take place. In many instances a cure can be accomplished. Improvement is shown by the lessening of the pyuria and dysuria; decrease of vesical symptoms, and the improvement of renal function. The administration internally of urotropin and acid sodium phosphate is a valuable adjunct in combating this condition.

NONOBSTRUCTIVE STRICTURE.

It is this type of stricture that I particularly wish to emphasize as more difficult of diagnosis and, in consequence, more frequently overlooked. It can be defined as a small area of infiltration in the ureteral wall encroaching upon the lumen but not sufficient to produce a dilatation of the proximal portion of the ureter and renal pelvis. Their location in the female nearly always is in the pelvic portion of the ureter.

Etiology—As a rule, this type of stricture is produced by infections of the adnexa, parametrium, uterus, and cervix transmitted through the lymphatic vessels that communicate with the periureteral lymphatics. The infection so transmitted to the ureter is of a chronic low grade type, and the ureteral infiltration produced is not acute in character but insidious in its establishment.

The lymphatics of the ureter, according to Eisendrath, are divided into three sets; first, the submucous group that run under the mucous membrane and are continuous with those of the bladder and kidney; second, the muscular group that run upward from the bladder musculature through the muscular coats of the ureter; third, the external or periureteral group that are contained in the sheath of the ureter. These groups of lymphatic vessels traverse upward to the kidney substance and no doubt communicate with each other in their course. Kumita has shown that the periureteral group of lymph vessels communicate freely with the ovaries, fallopian tubes, broad ligaments and uterus. Sturmdorf has also shown that the cervical lymphatics travel upward into the myometrium of the uterus, as well as the broad ligament. It is, therefore, highly probable that infections of the endocervix, adnexa, and uterus are transmitted through the communication with the periureteral group of lymph vessels and secondarily infect the kidney and ureters.

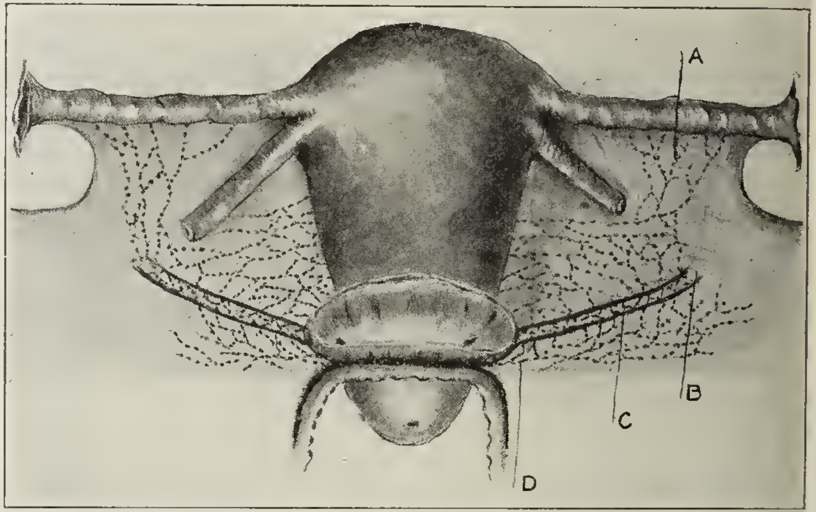

Fig. 1.—Schematic drawing showing uterus, broad ligaments, base of bladder and ureters, with the lymphatics draining the uterus, adnexa and cervix communicating with the periureteral lymphatics. A, tubal lymphatics; B, ureter; C, periureteral lymphatics; D, lymphatics from cervix.

Through the anastamosing lymphatic channels draining the cervix and adnexa with the periureteral lymphatics into the broad ligament, areas of infection in the sheath of the pelvic portion of the ureter may occur. These areas may persist and remain local

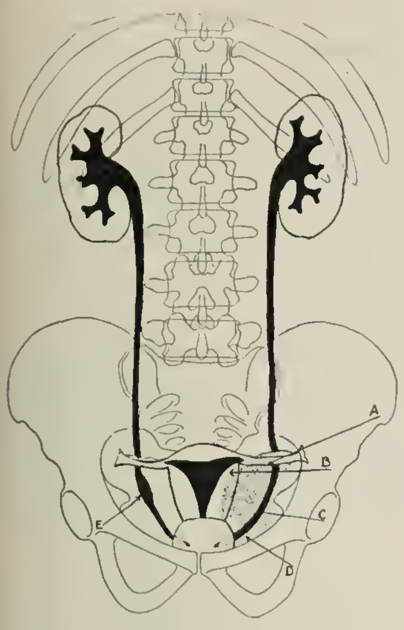

FIG. 2.

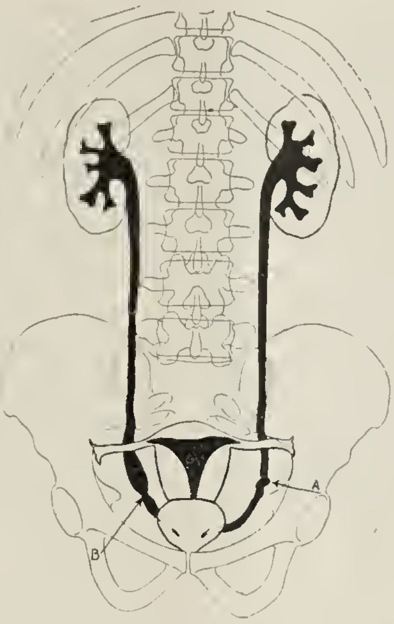

FIG. 3.

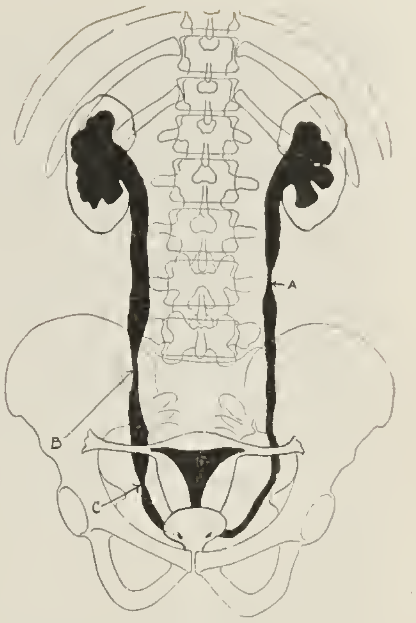

FIG. 4.

FIG. 2.—Shows on the left side a pyelographic tracing of a normal ureter and renal pelvis. In the pelvic portion of the ureter the lymph channels from the adnexa, uterus and cervix are communicating with the periureteral group. On the right side a periureteral infiltration of the right ureteral sheath is shown, a condition following operation on the cervix for endocervicitis. Symptoms of frequency and dysuria are relieved by bougie dilatation. A, adnexal lymphatics; B, uterine lymphatics; C, periureteral lymphatics; D, lymphatic vessels draining cervix; E, infiltration of ureteral sheath.

FIG. 3.—Left side shows ureterographic tracing of ureter distortion from infection of ureteral sheath with adhesions. Symptoms of dysuria, left sided abdominal pain, frequency of urination. Right side represents a ureteropyelographic tracing showing a stricture of pelvic ureter with fusiform dilatation; no obstruction present. This can readily progress to the obstructive type of stricture. A, ureteral kink; B, nonobstructive stricture.

FIG. 4.—Left side shows a ureteropyelographic tracing of an obstructive stricture of the lumbar ureter with accompanying degree of moderate hydronephrosis; diminished function of kidney. Relieved partially by bougie dilatation. Right side represents a double stricture with hydronephrosis and renal infections, with markedly diminished renal function. Bougie dilatation relieves partially. A, obstructive stricture; B and C, double stricture with hydronephrosis and renal infection.

in this part of the ureter or the infection may be carried up through the periureteral lymphatics and infect the kidney. When the infiltration remains local there forms either a nonobstructive stricture—producing urinary symptoms—or the infiltration does not encroach upon the lumen of the ureter but remains as a ureteral sheath exudate or infiltration, which produces symptoms similar to the stricture formation. This theory has been exemplified and in my opinion proved to exist in numerous cases in which the patients have been operated upon for infected endocervicitis and in chronic adnexal disease. In some instances acute infection of the kidney has occurred with a definite temperature and pyuria which, upon cystoscopic examination, has been definitely shown. This infection of the kidney usually occurs in five to ten days postoperative while the patient is still in the hospital.

The ureteral sheath lesion is a more chronic process and requires a longer period of time for its formation and the production of symptoms; there is no attendant rise in temperature and its occurrence in all cases seen by me, follows the patient's discharge from the hospital. The patient returns to the follow-up clinic complaining of frequency of urination and, upon cystoscopic examination, catheterized urine and the bladder picture are negative. Catheterization of the ureter upon the painful side does not, as a rule, show any obstruction; neither does the urine from the kidney show any departure from normal. Vaginal examination discloses a tender spot in the broad ligament in the region of the ureter. The passage of the urinary catheter in the routine examination (a No. 5, or a No. 6) as a rule relieves the patient, particularly from dysuria and frequency of urination. Acting upon these findings, it has been my routine practice, when in these postoperative cases the patients return with symptoms of this kind, to assume that a periureteral infiltration has occurred and dilate the ureter on the affected side with a No. 8, 9 or 10 bougie. Following this treatment there has been marked relief of the symptoms and in the course of time, upon repeating this line of treatment, a complete cure in the majority of cases has been obtained.

Pathology—The wall of the ureter first becomes infiltrated by round cells; later a formation of new interstitial tissue takes place that in the more advanced state may become fibrous. This process in the wall of the ureter interferes with the normal peristaltic ureteric waves. Such an interference with this function causes a loss of muscular tone followed by stasis of the urinary flow. Spasmodic contractions may also be established that are transmitted to the bladder wall producing painful contractions. Dilatation of the proximal ureter may also occur, depending upon the amount of encroachment of its lumen. This type of stricture may remain for a long period of time as a nonobstructive type but it may progress into the obstructive type, later producing hydroureter and hydronephrosis.

Symptoms—The subjective symptoms that stand out most prominently in this nonobstructive stricture are painful and frequent urination. Abdominal pain is a frequent symptom; it is usually intermittent and spasmodic in character and at times may be so acute as to influence one to operate—an urgent abdominal condition. Reflex gastric and intestinal pains occasionally are present that mask the real pathology.

Examination—There may be a tender point on the abdomen in the region of the brim of the pelvis. Vaginal investigation shows signs of endocervicitis with tenderness of the broad ligament on the affected side. Catheterized bladder urine is usually clear and microscopically negative.

Cystoscopic examination—Through the cystoscope a normal bladder mucosa and ureteral orifices are seen. Upon passing a catheter an obstruction may be met which prevents its progress, but upon manipulation and relaxation of spasm at that point it may pass readily up to the renal pelvis. In order to pass the obstruction in some instances it may be necessary to withdraw the catheter and pass a smaller one. Urine from that kidney shows nothing significant microscopically or by culture, and renal functional tests show a normal output of dye.

Pyelography—Pyelography may be of great value in this group of partial obstruction where there is some degree of ureteral dilatation above the stricture. In cases where there is no obstruction it is of little use as a diagnostic measure. It has seemed to me that the most pronounced cases of dysuria and frequency with nocturia eight to twelve times showed nothing in a ureterogram or pyelogram. In the investigation of such cases in which the urinary and genital tract appear normal, but the symptoms are entirely urinary, it has been my custom to institute immediate ureteral dilatation. When such instrumentation has produced relief of the symptoms I have diagnosed the condition as a nonobstructive stricture. This measure I have designated a therapeutic and diagnostic ureteral dilatation.

In the diagnosis of these small nonobstructive strictures Hunner uses a series of wax tipped bougies of various sizes which he introduces through a Kelly endoscope. Upon withdrawing the bougie, if he gets the socalled ureteral hang or jump, the diagnosis is correct from a clinical point of view. This method of course cannot be used satisfactorily with the water cystoscope.

Treatment—Gradual dilatation of the stricture by means of gradual bougies is the method of choice. This must necessarily continue over a long period of time, at first given seven to twelve days apart, depending upon the amount of reaction that follows. The interval is then prolonged unless the symptoms recur. During bougie dilatation over a prolonged period one must use the utmost precaution in regard to asepsis, as it occasionally happens such frequent instrumentation will set up a cystitis. To prevent such an occurrence it is a good plan to inject fifteen per cent. argyrol solution into the bladder following each instrumentation.

SUMMARY

1. Ureteral stricture in the female, of the nonobstructive type, is a much more frequent entity than is generally recognized. In view of this frequency we should investigate thoroughly the urinary tract of gynecological patients who complain of urinary symptoms.
2. The etiology of this condition is a transmission of a low grade infection through the medium of the periureteral lymphatics communicating with those of the adnexa, uterus, broad ligament and endocervix.
3. Gradual bougie dilatation is the treatment of choice and good results can be expected in the nonobstructive type.
4. In the obstructive type of stricture, with marked kidney infection and poor renal function, ureteral dilatation should be given a trial before more radical measures are instituted.

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Nasal Dysmenorrhea

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The following seems to be a true case of nasal dysmenorrhea.

Case I.—J. S., aged twenty-one, single, by occupation a typist, had had the usual diseases of childhood. Menstruation began at thirteen, was of the twenty-eight day variety, and usually lasted five to six days. She had always had some menstrual, but no premenstrual pain. Her history was otherwise negative, except for a submucous resection of the nasal septum seven years ago. Her last menstrual period had occurred the latter part of September, 1922.

I was called to see the patient on October 25th, three days after her regular period began, and found her in great pain. By questioning the patient I learned that her period had begun at the expected time and was accompanied by the usual pains. With this period, however, the pains increased in severity, and with the progress of the flow they became so severe as to cause retching and vomiting with the severe uterine contractions. The patient ascribed her condition to some food she had taken two days before, and thought she had an "upset stomach"; hence had not eaten anything for two days.

Examination revealed a fairly well nourished girl, menstruating, evidently in great pain, crying out with each uterine contraction. Her temperature was 99°, pulse 84, respirations 20. The heart and lungs were negative, the abdomen was soft, and there was no tenderness, distention, or rigidity. She complained of some soreness in the abdominal muscles, evidently caused by the repeated retching. The uterine bleeding was moderate in amount, and normal in appearance and odor. I was compelled to administer a hypodermic injection of morphine to control the pain, and advised hot applications to the lower abdomen, hot drinks, and an enema to clear the bowels. I also prescribed tablets of phenacetine and codeine, and left, feeling that in a short time the pains would cease.

About six hours later I was called again, and found the patient in greater agony than before. Examination was negative. I had to repeat the morphine, ordered more hot drinks, another hot enema, and a uterine sedative, and went away.

Two hours later, I was notified that the patient was in very severe pain and had vomited several times. When I got there, she was tossing about on the bed, suffering from excruciating pain. Examination again showed no new evidences of any pathological condition other than that found at the previous visits, except a slightly increased pulse rate. I was about to administer another dose of morphine, when I thought of an intranasal application of cocaine. To control the experiment, and guard against suggestion as a possible factor, I first applied plain water to both lower turbinates and the portion of the septum opposite these. Ten minutes of waiting brought no cessation of the pains; so I painted the same areas with twenty per cent. watery solution of cocaine. Five minutes after this application, the pains stopped and the patient was comfortable.

I saw her again the following day, and found her up and about, free from pain except for a slightly sore abdomen. She had had no further colic after the intranasal application of cocaine. I finally advised the patient to have these intranasal genital spots cauterized, feeling convinced that this was a true case of nasal dysmenorrhea.

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The Differential Count of Appendicitis, Tuboovarian Diseases and Infection of the Uterine Cavity

By A. J. HINKELMAN,
Oklahoma City, Oklahoma.

Diagnosis of infection of one or the other of these three different parts of the female anatomy is a question with which the surgeon and the gynecologist is frequently confronted. The results, however, of the best technic of modern means of differential counting from stained films of blood made on slides have always lacked the accuracy and consistency to apply safely to anything, except gross or marked variations of the normal numerical relationship of the various white cells of the blood, and, consequently, never have been of much value in differential diagnosis of internal infections.

Hematimetric differential counting (1), however, or counting from a measured quantity of blood on the counting chamber, and based upon a count of from three thousand to eight thousand cells, has revealed to me that the character of the differential count is very consistent in the various infections commonly met with in surgery and gynecology, and furthermore, that there is a distinct difference in the character of those infections that readily threaten the life of the patient and those that do not. The following tables, which constitute a representative average of a large number of differential counts made, show how this difference is manifested in the infections of the three principal seats dealt with in this article.

In the case of appendicitis it will be noted that there is a definite inverse manner in which the process affects the two types of granular cells of the blood, the polymorphonuclear cells and the eosinophiles. Regardless of whether the process is acute, subacute, chronic or the appendix ruptured, the former cells will always be found above normal absolute numbers, while the latter will be found much reduced and usually absent among from three thousand to eight thousand cells. The same is also true to some extent regarding the small lymphocytes. There is always a tendency of these cells to be below normal numbers rather than above, depending upon the severity and duration of the infection.

The count of tuboovarian infection is more or less of the opposite character. In all such cases, where there is an increase in the total number of leucocytes, this increase represents to some extent all of the cells commonly present in the blood except the large lymphocytes, which usually remain normal in numbers.

On the other hand, again, the count of uterine infections, such as that following incomplete abortion, is much the same as that of acute appendicitis, different only in the respect that the reduction of the number of eosinophiles and small lymphocytes is of a more striking character.

TABLE I.

ACUTE, SUBACUTE AND CHRONIC APPENDICITIS.

Case	*Total Count*	*Polymorph.*	*Eosin.*	*Small L.*	*Large L.*
1	20000	18800	0	1000	200****
2	9000	7000	0	1600	400***
3	18000	15300	0	1980	720*
4	16700	15000	0	1500	200*
5	12000	10680	0	1120	200****
6	8400	7000	0	1000	400***
7	11000	9600	0	1000	400****
8	7000	6000	0	800	200****
9	10000	8600	0	1000	400**
10	7000	5600	0	1000	400***
11	7000	5810	0	1000	190*
12	10000	9000	0	900	100*
13	7200	5000	200	1600	400*****
14	8000	6400	0	1200	400*
15	19000	17000	0	1600	400*
16	12000	10000	0	1800	200*
17	21000	17000	22	3578	400*****
18	11000	9600	0	1300	100*
19	9000	6700	50	2000	200*****
20	9000	6300	0	1800	200***
21	7000	5200	0	1400	400*
22	6000	4000	60	1740	200*****
23	7000	5600	0	1000	400**
24	12000	10800	0	1000	200****
25	7000	5400	0	1200	400***

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*Acute. **Subacute. ***Chronic. ****Ruptured appendix. *****Complicated with salpingitis or disease of the ovary.

TABLE II.

ACUTE AND CHRONIC SALPINGITIS AND DISEASE OF THE OVARIES.

Case	*Total Count*	*Polymorph.*	*Eosin.*	*Small L.*	*Large L.*
1	10000	7600	200	2000	200*
2	10000	7500	300	2000	200*
3	8000	6500	200	1800	500**
4	10000	7400	200	2000	400*
5	18000	15600	180	2000	400*
6	10000	6800	200	2400	600***

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*Acute salpingitis. **Chronic salpingitis. ***Disease of the ovaries. ****Salpingitis and abortion. *****Salpingitis and appendicitis.

TABLE II—*Continued.*

Case	*Total Count*	*Polymorph.*	*Eosin.*	*Small L.*	*Large L.*
7	18000	14400	400	2800	400*
8	6600	3600	200	2400	400***
9	14000	10000	100	3000	900*
10	7000	3800	0	3000	200**
11	8200	5000	0	2800	400**
12	30000	26600	0	3000	400*
13	19000	16800	200	1600	400****
14	8000	4800	100	2600	500***
15	7000	3800	200	2400	600***
16	7200	5000	200	1600	400*****
17	8000	5000	0	2450	550**
18	6000	2800	100	2800	300**
19	8000	4800	100	2500	600**
20	6000	3940	60	1800	200*****
21	12000	9800	100	1900	200*

*Acute salpingitis. **Chronic salpingitis. ***Disease of the ovaries. ****Salpingitis and abortion. *****Salpingitis and appendicitis.

TABLE III.

DISEASES OF THE UTERINE CAVITY.

Case	*Total Count*	*Polymorph.*	*Eosin.*	*Small L.*	*Large L.*
1	10000	8500	0	1000	500*
2	12000	10200	0	1500	300*
3	7000	6000	0	800	200*
4	7000	5400	0	1400	200*
5	10000	9000	0	900	100*
6	12000	10400	0	1000	600*
7	12000	9840	0	1800	360*
8	10000	8600	0	1000	200**
9	6000	4800	0	1000	200***
10	14000	12600	0	1000	400*

*Incomplete abortion. **Acute endometritis. ***Chronic endometritis with malignancy of the cervix.

CONCLUSION.

According to the foregoing, it is plain that the process of chemotaxis is differently evolved in the usual infections of the three different seats herein dealt with.

1. In the case of appendicitis it is apparent that the positive chemotactic elements, liberated into the circulation from the inflamed area, are solely those that stimulate the production of the polymorphonuclear type of leucocytes. As a result of this, the eosinophiles are taken out of the circulation more rapidly than they are replaced, resulting in a rapid reduction of their usual absolute numbers, while the same reduction is also shown sooner or later regarding the small lymphocytes. In brief, it can be said that the count of an uncomplicated case of appendicitis is that of a polymorphonuclear leucocytosis, with a marked reduction of the absolute number of eosinophiles and a tendency toward a reduction of the normal number of small lymphocytes.

2. The differential count of tuboovarian infections differs from appendicitis in the sense that the chemotactic elements liberated from tuboovarian infections stimulate, to a greater or less extent, the production of all of the leucocytes commonly present in the blood, excepting the large lymphocytes. The count is distinctly that of an absolute leucocytosis, whenever there is an increase, with the tendency of both the eosinophiles and the small lymphocytes to rise considerably above normal absolute numbers.

3. In the infections of the uterine cavity, the chemotactic elements liberated are apparently of the same character as those from the inflamed area of an acutely diseased appendix, only of a more powerful nature, or liberated in greater quantity, resulting in a characteristic polymorphonuclear leucocytosis, with a striking reduction of the absolute number of eosinophiles and the small lymphocytes early in the process.

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Complete Congenital Absence of the Vagina, Associated with Bilateral Hernias of Uterus, Tubes and Ovaries*

By D. DEUTSCHMAN, M.D.,
New York.

Case I.—Mrs. E. A., thirty-four years of age, was born in Russia, a housewife by occupation. No genital defects were present, as far as could be ascertained, in any member of her near or remote relatives. The patient had never menstruated, nor had there been any vicarious discharge of blood from any organ, and never had had any periodical pains or uneasiness in the pelvic region. Mentally she was bright, alert, and in appearance was typically feminine.

At the age of eighteen years, on the advice of her relatives, she consulted a physician in her native town concerning her delayed menstruation. The doctor (?), without subjecting the virgin to the indignity of a pelvic examination, pronounced the case as one of an abnormally thick, imperforate hymen and advised the patient to marry, advice which she readily acted upon. This therapeutic suggestion, however, was ineffectual and so the matrimonial bliss was of short duration, terminating after several futile attempts at intromission.

About six months preceding her operation the patient began to complain of bilateral inguinal pain, which became intensified on overexertion. Physical examination showed a young woman with typically feminine features. The mammary glands were normally developed and the pubic hair was of normal feminine distribution. The mons veneris and the external genitalia were regular in character. At the usual site of the hymen there was a cord septum and in place of the vulvar orifice there was the meatus urethræ, which was somewhat dilated and which was demonstrated by the insertion of a catheter through this opening into the bladder. A rectal examination revealed the absence of the vagina, showing the vesical and rectal walls in contact, and the catheter which was inserted into the bladder could easily be felt through the rectum. No uterus, tubes, or ovaries could be made out. There was no sign of any collection of menstrual fluid in the pelvic cavity. In the right inguinal region was a mass which, after coughing, assumed the size of a pigeon's egg. It apparently emerged from the external inguinal ring and was completely reducible. In the left inguinal region there was a similar mass but smaller in size.

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*This case was presented before the Bronx County Medical Society, October, 1922.

On October 20, 1922, the patient was operated upon for bilateral hernias. The following condition was revealed. On opening the sac on the right side it was found to contain a large cystic ovary, which was adherent with its ligament to the sac. A mass was felt in the anterior wall of the sac. This was recognized to be a rudimentary uterus and tube. The posterior wall of the uterus formed the anterior wall of the sac. The uterus was, therefore, extraperitoneal; in other words, it was a sliding hernia. This, of course, made it impossible to reduce the uterus and at the same time perform a high ligation of the sac. The peritoneum was, therefore, peeled off from the posterior wall of the uterus and the sac then ligated at its neck. That left the uterus, tube, and ovary lying free in the inguinal canal.

Since the uterus and tube were worthless and the ovary cystic they were all removed. On the left side a sliding hernia of the left tube and ovary was found. Since this ovary was also cystic it was thought best to extirpate it. The excised uterus had no lumen and to its right cornu was attached a short rudimentary tube. This also had no lumen and no fimbriæ. The right ovary was normal in size but full of cysts. The left tube was similar and cordlike and also without a lumen. The left ovary was also cystic.

The explanation offered in the medical literature regarding the disturbing factor in the embryonic cells leading to congenital anomalies of the genital organs has always been of a speculative character. It is assumed that failure in the development of the Müller ducts will result in some genital deformity, but the primary or underlying cause of this embryological perversion is still shrouded in a mystery.

CONCLUSION.

The congenital anomaly in this case is, apparently, due to a failure of the Müller ducts to develop properly. The lack of fusion of the lower extremities of these ducts resulted in the absence of the vagina. The uterus was formed from the right duct or from a short fused section of both ducts. Its development was interfered with and no lumen was formed in the uterus. The tubes that were removed were strands of the upper ends of the Müller ducts.

The presence of the pelvic organs in the inguinal hernias is interesting. Normally the ovary descends from a position in the lumbar region, which it occupies in the eighth week, to the final position in the true pelvis. Its downward descent may result in its halting at any level, a process similar to that of the testes. What happened in this case was a descent of the ovary to the inguinal canal. On the right side this descent dragged along the rudimentary tube and uterus and, on the left side, the rudimentary tube.

The patient made an uneventful recovery and almost a year after the operation had not shown any effects of the double ovariectomy.

In connection with this case I wish to express my gratefulness to Dr. Eugene Klein for his valuable assistance at the operation and for his cooperation in the preparation of this case report.

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Report of a Case of Postmortem Cæsarean Section

By M. J. STONE, M.D.,
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HISTORICAL.

There are four fairly distinct periods during which postmortem Cæsarean section was practised with more or less regularity. The first period dates from Cæsar's birth to the sixteenth century, the second from the sixteenth to the eighteenth century, the third from the eighteenth to the nineteenth century, and the fourth from the nineteenth century to the present day.

Even before Cæsar's birth, legend has it that Æsculapius, god of medicine, was delivered by Cæsarean section and Bacchus, god of wine, was delivered by Mercury in a similar manner. Also included in the list are Lycus, Manilius and Scipio the African. The Cæsarean operation early in its practice enjoyed much favor by benefit of civil laws and ecclesiastical mandate and encouragement.

However, during the eighteenth century it was brought into disrepute because of the common practice of operating on women before death. Tarnier, himself, while still an intern suffered public condemnation, his accusers asserting that he performed the operation antemortem, upon a woman dying from meningitis and was required to offer explanations, and clear himself from blame. It was he who first suggested that postmortem Cæsarean section had better not be performed before the viable period of gestation, which he placed at seven and one half months.

During the eighteenth century as Cæsarean section fell into disrepute, accouchement forcé gained in favor and was looked upon as the operation of choice. However, about this same time Cæsarean operations upon the living were being performed in increasing numbers with a fair degree of success by Tarnier and others, and the mortality rate lessened as improvements in technic were evolved. Reflected glory began to shine upon the one time honored postmortem operation so that about the latter part of the nineteenth century, Cæsarean section upon the dead was again favorably accepted (1).

REPORT OF CASE.

Case.—The patient, Mrs. I. W., thirty-eight years of age, para IX, in the eighth month of gestation was admitted to Lebanon Hospital on January 6, 1922, suffering from bronchopneumonia and pulmonary edema. Her temperature was 102° F., pulse 120, respiration 45. Dyspnea, cyanosis, edema of lower extremities, and enlarged liver were outstanding evidences that her rheumatic heart, dilated to right and left, weakened by former pregnancies, groaning under the load of the present one, and overwhelmed by the superimposed acute infection, would no longer hold out against such tremendous odds and death was imminent. Measures for removing the child at this time were deemed inadvisable on account of the critical state of the mother. An immediate venesection, removing 600 c. c. of blood, large doses of atropine, the administration of digitalis, and other supportive and stimulative measures prolonged life until seventy-two hours after admission to the hospital. Death being verified by another physician, I removed the child exactly one minute later by Cæsarean section. All necessary instruments for removal and resuscitation of the baby had been held in readiness constantly at the patient's bedside. Spontaneous respiration did not occur, but after vigorous efforts at resuscitation the child began to breathe rhythmically thirty minutes after delivery. It took feedings very well through a dropper, cried lustily, maintained a healthy pink color, and gave every indication that it might survive. However, fifteen hours later it became cyanotic, breathed with difficulty, and promptly died.

LEGAL ASPECT.

If consent for operation is not given promptly, or is even refused, and the fetal heart is still beating, it is not only permissible but imperative that the physician immediately do everything in his power to save the child (2). However, it is advisable, whenever possible, to have another physician verify the death to save oneself from unpleasant criticism.

THE PROGNOSIS.

As regards the survival of the child, prognosis depends upon the following considerations which are discussed below:

1. Month of gestation.
2. Cause of death of mother.
3. Time elapsed between death of mother and extraction of child.
4. Weight of child.
5. Syphilis or tuberculosis acting as cause of death or concomitant condition.

Postmortem Cæsarean section should not be attempted before the thirtieth week of gestation.

The child has a good chance to live if death of mother has been sudden, either traumatic or organic, such as embolism, etc.

The outlook for the child is poor if the mother has died after a prolonged illness, especially from pulmonary or cardiac disease, in which case there has occurred a carbon dioxide stasis and the oxygen which should go to the infant is held by the mother.

Blood diseases, severe acute infections, and poisoning give a bad prognosis. In the latter two conditions placental apoplexy has been found.

It is futile to attempt to obtain a living child more than twenty-five minutes postmortem.

The best results are obtained within the first seven minutes, after which time the child's chances for survival are markedly diminished.

The weight of the child and whether or not syphilis or tuberculosis is present are factors which affect the life of the child in much the same way as in delivery during life.

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A New Type of Cæsarean Technic

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The history of Cæsarean section is clouded in obscurity. Many statements, illogical and beyond proof, have been made regarding the efforts of the early obstetrical surgeons. Efforts made to discover traces of its origin in the Talmud have been refuted by equally enthusiastic writers and searchers after truth. "Numa's law," established by Numa Pompilius about 700 B. C., interdicted the interment of a woman, big with child, until her belly was opened. This wise and prudent law was received and adopted throughout Christendom.

From a review of contemporary literature, we conclude that the earlier efforts to save the unborn child were confined to postmortem procedures and were then gradually extended to an attempt to save both mother and child. These efforts were, of course, discouraging up to the advent of antiseptic and aseptic surgery. During this time, dating from the fifteenth century to the time of Lister, the movement had its periods of rise and fall, according to the thinking and acting men of the time in the art of obstetrics. As has been the case with all movements, the development of Cæsarean section to its present status has been a long and difficult task, accompanied by tragedy, and unfortunately tragedy still lurks in the shadows of this important procedure.

All of us who operate to any extent have had unfortunate results. We have all seen classical cases of Cæsarean section, socalled elective cases in which the patients, who never had had a vaginal examination, died from peritonitis. This is a rare occurrence, of course, but it happens sufficiently often to make us stop and think before suggesting the operation. Many of us can remember when the operation was a widely advertised feature of our clinics, which were always well attended, and the operating room amphitheatres crowded to full capacity. The technic of this operation has varied from the classical procedure of hysterotomy to the Porro method; the kind of incision has also changed, as well as the methods of closure of the uterine wound.

Deaths of mothers from peritonitis and other infections have followed what has been considered greater conservatism in the use of other methods of delivery, necessitating, often, the sacrifice of the child as well. It is the failure to realize the immediate dangers from infection and the invalidism resulting from injuries to the birth canal that is frequently the deciding factor against abdominal interference. These unfortunate incidents have led to the conclusion that in those cases in which the patient is either potentially or frankly infected, we must abandon the classical procedure and attempt to avoid the probabilities or possibilities of infection by an extraperitonealization of our operative field. There are real extraperitoneal operative procedures.

The history of the operative methods of delivery shows numerous revivals at different periods of a procedure which had been carried out years previously, but, so far as I can find, no mention is made of the method I advise here. As far back as 1870 the extraperitoneal method of delivery was revived by T. Gaillard Thomas, to which he applied the term gastroelytrotomy. In the third edition of De Lee's book (1) he states his choice of cases in which the classical operation should be performed and adds: "In all other clean cases Krönig's method is the one of choice. When the woman is positively infected, when she has had many attempts at delivery, if a Porro is not done, the author holds that craniotomy is the safer operation." He further states: "In those cases where infection is apparently mild, or only suspected, the true extraperitoneal operation of Latzko is the one to be selected."

I also quote B. C. Hirst (2). He argues in favor of the extraperitoneal operation even in clean cases: "If a patient comes to me not merely suspicious but indubitably infected, I prefer the operation I have done with success in several instances, that is, the delivery of the uterus through a long abdominal incision; scrupulously careful padding off; the evacuation of the womb, its supravaginal amputation, etc." All these efforts, with the exception of the Latzko extraperitoneal procedure, vary only in degree from the original Porro, but all are preceded by delivery before hysterectomy. The only recent real work of the Latzko type of operation has been carried out by Asa B. Davis.

Much energy has been expended in an attempt to prove to the medical public that a transperitoneal operation could be made extraperitoneal. The arguments are, to my mind, illogical and unconvincing. By statistics you can prove anything, because human judgment is faulty. We never know when a patient becomes actually infected, consequently, when one of these potentially infected patients recovers after a transperitoneal flap procedure, we pat ourselves on the back and say: "Another victory over King Streptococcus," when, as a matter of fact, those of us who have been operating for over a quarter of a century could cite innumerable recoveries following the old classical hysterotomy in the same type of cases. The arguments may well be classed as camouflage. I do not decry the arguments or the efforts, only the results. When we see a patient with ruptured membranes, who has had numerous vaginal examinations, with perhaps an attempt at delivery by forceps, who has a temperature and a rapid pulse, and has already shown the preliminary signs of sepsis, we are dealing with a uterus which has become as dangerous to the organism as an inflammatory appendix. When once you make such a diagnosis, it must be dealt with accordingly. This has been attempted in the past, as the history of the development of the operation shows, but in a reverse order, namely, hysterotomy succeeded by hysterectomy.

Why all this prologue? Am I to tear down and not try to build up? No! I have a procedure to offer, well knowing the criticisms and storms of disapproval it will bring upon my head.

In the first place, having decided we have a frankly infected uterus, why make any attempt to bury it in the rich lymphatic plexus of the pelvis? If it is really an infected case we cannot bury it deep enough to avoid the next step in the history of the case, namely, peritonitis and death, because the peritoneum is part of the lymphatic system. *It must be removed.* Here is where even Porro himself failed because at the time during which he lived, other operators made the same mistake. What is this mistake? Hysterotomy preceding hysterectomy—a simple transition of the order of procedure is all that is necessary, i. e., *Hysterectomy preceding hysterotomy.*

The operation requires, of course, an extensive abdominal incision, sufficient to eventrate the uterus with its contents. The next step is a careful packing off, by means of wet gauze, of that portion of the pelvic and abdominal cavity posterior to and above the uterus, not only to prevent trouble from extrusion of the intestines, but also to catch any possible spill from the amputation, through the cervix. This is minimal, because of the fact that in the cases selected for this procedure, the membranes have already ruptured and the amniotic fluid has drained away. The hysterectomy is done by preceding the excision by the clamp method for the control of hemorrhage; a stripping downward and packing off of the bladder; then a quick cutting of the broad ligaments and the cervix with scissors. The time, from the shutting off of the circulation to the passing over of the hysterectomatized uterus to an assistant for incision and delivery, should not exceed five minutes. This is ample time for the delivery of a living baby. I have had only one postmortem Cæsarean section and the interval, in that particular case, from the time of the death of the mother to the delivery of a living child, was seven minutes.

I feel that this method should become the procedure of choice in the class of cases described above where the chance of both mother and child is to be considered, because I feel that the protective value of the flap operation is questionable as a protective measure against infection when really dealing with an undoubtedly infected case.

This method of procedure I have carried out in two cases up to this writing. My success in both cases in securing a living mother and child proves nothing except that it is easily done.

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Historical Medicine

The Dawn of Surgery

Obstetrical and Gynecological Operations

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So many of my notes on the obstetrics of primitive people have appeared elsewhere (1) that the reader is referred there for a fuller account of the subject, to which what I have here to say is meant to be supplementary. Though at the risk of some repetition, I may be allowed to say a word or two more of the wild man's obstetrical operations which preceded his earliest entrance into a state of civilization, if we are permitted to throw the light modern ethnology affords on the dark places of paleology and of history.

It is well known that many if not most primitive women bear their children in a squatting position. Sometimes it takes place in the open or in the bush outside the hut. The Sinaugolo women, sitting on a cocoanut to support the perineum, receive obstetrical care, which in the illustration (Fig. 2) looks efficient and may have been safe enough in the bush (2). One can only reflect that the modern practitioner might think gynecological operations would often be necessary as the result of such obstetrical technic, but this does not seem to be the case. Among some tribes any trouble with the parturient process is blamed on some transgression of moral laws on the part of the woman. Such exceptional phenomena, as well as those of twins or multiple pregnancy, which is a disgrace, so like the animals, were dealt with somewhat in that spirit of intolerance of the temptations and the sins of others, which is a characteristic not wholly absent from the ethics of civilization. One of the first duties of the wise woman of the Bechuana kraal is to twist the neck of a child that has the misfortune to present himself feet first to the world and another is to throw twins into the bush for the wild beasts. Later, if the child is so rash as to cut its upper teeth first, it is put to death, (3) but for all this the primitive midwife acquires skill, dexterity and undoubtedly good judgment from her experience with her patient and the environment. De Sahagun (4) says of the Mexican civilization as the Spaniards found it, that the midwives were very skillful. When she saw the baby was dead in its mother, because it did not move, and the woman was in great pain, the midwife placed her hand in the parturient canal and with a stone knife cut the body of the baby and drew it out by its feet.

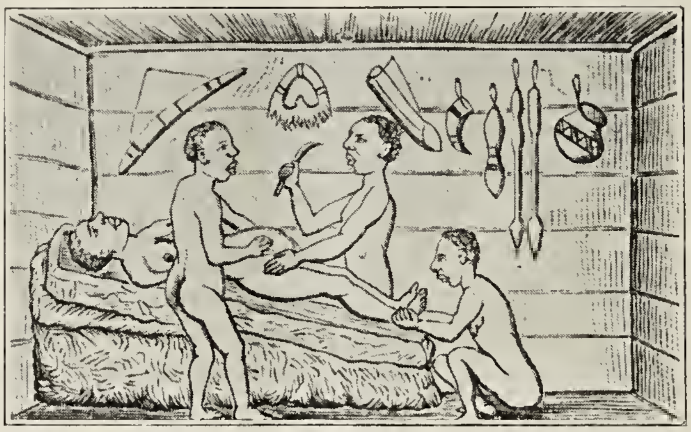

Fig. 1.—Cæsarean section in Uganda. (*After Bartels.*)

Despite the belief that the wild woman has less trouble with her labor pains than her cultured sister, she has them nevertheless and she doesn't like them, though her environment, like faith and fanaticism, tends to force physical pain into the subliminal. They do lead women among a limited number of primitive tribes to attempts to prevent conception or arrest pregnancy. To infanticide she is led usually by other motives than those which actuate the modern woman and her attendant, but the social environment sometimes has its influence also in these directions. Infanticide wounds no moral sentiment in the islands of the Pacific or in China among primitive people, but the desire of man to keep his woman to himself and to stray with the women of other men is well nigh universal, though not entirely so. Moral sentiment in many tribes looks with disfavor on the cohabitation of man and wife once pregnancy is known to have begun and this is the cause of much uphappiness to the woman as her husband seeks other female society. Sometimes cohabitation is frowned on while the woman is suckling the child. The "other woman" in the case is no more welcome in the savage than in the civilized ménage, and this is often a cause exceptionally influential in tempting the primitive woman to actions, immoral and illegitimate in our view, but not always in their own. These are not the only reasons that drive the primitive woman to infanticide and abortifacients, but they will serve to illustrate the sameness and the variations of the question which was apparently not less a problem when man emerged from his cave than when he comes down an elevator from the twentieth story in the twentieth century.

Among the islands of the Pacific instrumentation to interrupt pregnancy is almost everywhere practised, nearly half the pregnancies being thus terminated. In the Fiji Islands where midwifery is a distinct profession, exercised by women in all the towns, the observer also finds them very skillful. In the time of the Horatio Hale (5) exploring expedition it was said if the herbs did not work the destruction of the child *in utero,* it was to be strangled before it left the parturient canal, and this often on the insistence of the father that it should be brought forth dead. "Foremost among the mechanical means is the *sau,* which is a skewer made of losi-losi wood or a reed. It is used of course to pierce the membranes and in unskilful hands it must be a death dealing weapon," but with the knowledge of anatomy and the adroitness these women possess it is probable that not very often disaster results.

The operation very frequently is carried out while the patient is bathing in the sea (6).

Of the more legitimate operations of the accoucheuse of the primitive woman, or of those which seem more legitimate to our moral sentiment, I can not find room further to speak, but I may allude to laparotomy, which it is interesting to observe we find recorded as always the work of a man operator, even in labor cases. They had heard at least of laparotomy in extreme northeastern Asia, since Bogaras (7) found the shamans among the Chukchee pretend to do it with magic, in which a hot knife plays a part, but whether the medicine man had introduced some feat of modern surgery, transmitted from afar, into his hocus pocus, or whether there was a primitive laparotomy and whether he really ever does what he pretends, does not appear in the record. Bancroft (8) says an Indian guide told him he had seen the abdomen opened and a piece of fat cut out, sewed up again and the patient recovered from whatever symptoms he had. A Chippewa Indian was reported to have operated on his pregnant wife by Cæsarean section with good result, both mother and child surviving. The most striking accounts however we get from central Africa. Felkin (9) while camping among the natives of the Bari district was aroused in the night to witness such a performance and the vividness with which he portrays the scene is more than of surgical interest—it is dramatic. He says it is frequently performed in that neighborhood for delayed labor and sometimes it is successful. He tells of a case coming under his observation at Kahura in 1879, in which both mother and child were saved. One can hardly regard this practice as derived from civilized surgery since at that date it would have been difficult for a naked savage African to secure a training in it even in the best university centres of the civilized world. Felkin, indeed, surprised the natives by avoiding a Cæsarean operation on a woman by the use of the obstetrical forceps in public before an admiring group, but now the knife almost bids fair to supplant the forceps. Are we returning to savagery?

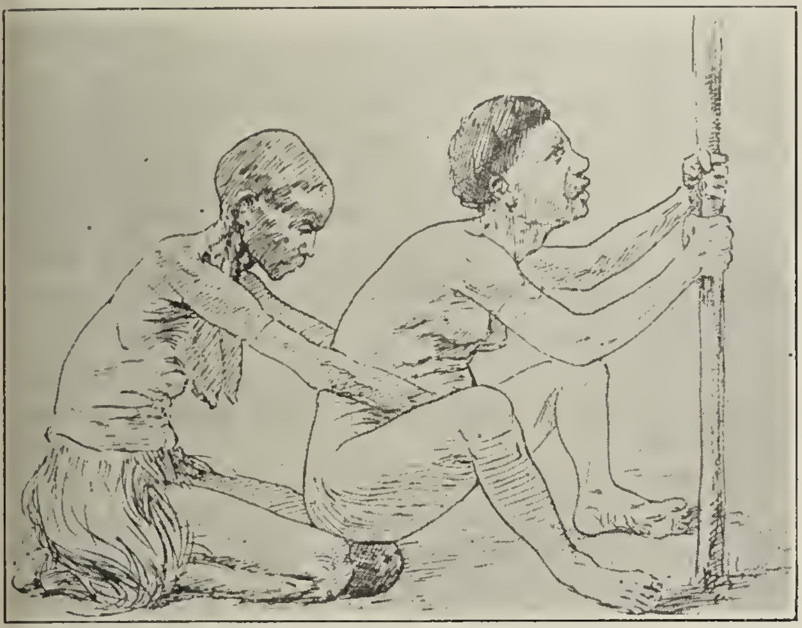

FIG. 2.—The medicine and surgery of the Sinaugolo. (*After Seligman.*)

Budge's tendency to put an African stamp on everything Egyptian, a tendency entirely justifiable unless too exclusively followed and there is strong presumption against it, led him not only to locate the Isles of the Blest in Lake Victoria but to make of Isis an African woman, because of her way of bringing forth children (10). On one of her representations he remarks: "The object on which Isis is seated suggests that during labor she sat on a stool, as women do in West Africa, and did not kneel as do Pygmy and Lendu women," and he is guided by the custom in Uganda when he says: "From this we learn that the umbilical cord of Osiris was cut off and that this cutting symbolized an act of purification, whereby the god was freed at his birth from impurity. In the Westcar papyrus we are told that when the three sons of Rettetet were born the four Meskhenet goddesses, who were present at their birth, washed in turn each child, cut off his umbilical cord, and placed it in a four sided cloth, which was laid in a stone box."

I wish to take this opportunity again to draw attention to the four sidedness of the Egyptian mind, here exemplified by the four attendants and the quadrangular cloth. It stood indeed four square to all the winds of Heaven, just as do its marvelous buildings. In previous articles in various journals I have referred to this and especially I have attempted (11) to show that it is more than suggestive of an influence on the birth of Greek cosmic philosophy and medical theory. The elements were four—earth, air, fire and water—and when ether was invented in that far away epoch it found no place for itself but had to be an adjunct of fire. It was not admitted into the tetrarchy, despite its manifest claim, for then in the existing state of physics it had as good a claim, almost, to reality as air. There were four humors, but to make out the four, they divided bile into two, yellow and black. There were four qualities, four colors, and weights and measures today still show in our own English the trend of the Egyptian mind to a tetrarchy. For Egypt drew its nourishment from the African bush and transmitted more than one trace of negro culture to European civilization.

Now in this Roman birth scene (Fig. 3) we find no trace of four attendants and were it not that one of the figures seems to be a male slave we would think that we find in it a trace of the Eilythyiæ. There was a town in ancient Egypt so named and this was the name under which archeologists have made us acquainted the most ancient Greek goddesses of childbirth. When we seek out three of them we

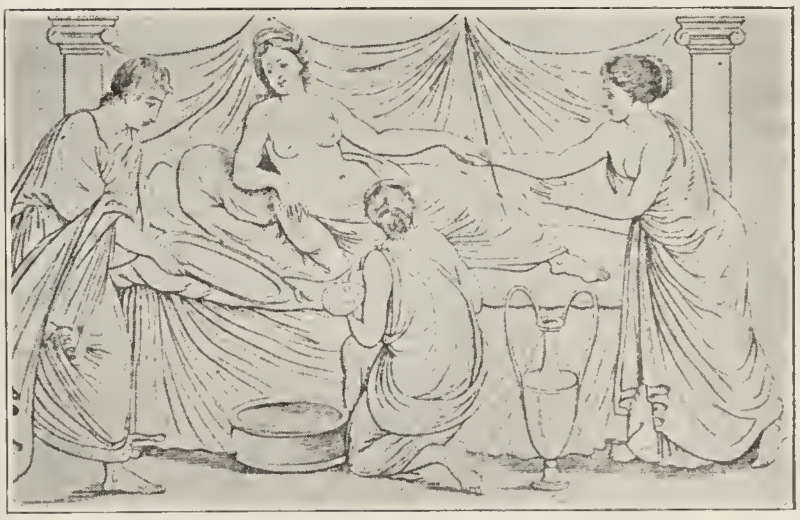

FIG. 3.—A Roman birth scene, from a wall painting.

do not always find just that number, but there are more than one of them usually and we have every reason to believe, that they are the lineal relatives of the Meskhenet goddesses attendant on Rettetet, whose name modern egyptologists attempt to spell in many ways. There are certain things, indeed there is a very large majority of the themes we find in the history of Greek civilization, that we trace back to the Egyptians and the Babylonians. On the whole, however, that is not strikingly true of Greek religion, as Farnell insists with moderate emphasis (12). Certainly the Egyptian tetrarchy was changed into a trinity, because for the European three is a lucky number, just as in China five is the favorite and everywhere seven is the choice in magic. When Herodotus and the Greeks of his time and those who came after him met with foreign gods on their travels and when they were subsequently domesticated at Rome identification was strained to make them seem familiar. Eilythyiæ is mentioned as one person once in the Iliad and subsequently once or twice - the plural use of the word is to be noted (XI. 270), but always assisting at childbirth. It was by the aid of the mutliple Eilythyiæ that Hera outwitted Zeus, the old sinner, both as to the birth of Herakles his son by Alkmene (13) and of Apollo his son by Leto (14).

In the matter of the myth which recounts the childbearing of Isis, when Horus was born, Budge (10) believes he sees a Sudani custom. She took refuge in the bush and was delivered there, but we have seen that the isolation of the parturient woman is all but universal among primitive peoples. The same may be said of the position assumed by the Egyptian women. "Certain pictures show that they either crouched on a bed or a mat with their legs bent under them, or sat on a chair which appears to be in no way different from an ordinary chair. The women who assembled to help took different parts. One placed herself behind the patient and clasped her round the body with her arms during the pains, thus affording her a firm support and assisting expulsion; the other placed herself in front of her, kneeling or crouching, ready to receive the infant in her hands and prevent its falling roughly to the ground. The two goddesses, Isis and Nephthys, come to assist Rudîtdidît, acted like the ordinary midwives, and Hiqaît hastened the birth by massaging the womb, as is still done by the Egyptian midwives of today" (15). This is closely African in its details, but not varying much from the lying-in customs of other primitive people. It is said a votive statue of a parturient woman in a squatting posture is among the objects from Cyprus in the Cesnola collection (16), and this was without doubt the posture in the earliest Egyptian times before the adoption of the birthstool, and probably obtained throughout the Mediterranean peoples in the Stone Age. Following the rule among uncivilized people and the Orientals, the function was presided over by females, perhaps especially trained for the purpose. The birthstool used by the Egyptians was a chair of somewhat horseshoe shape giving support to the gluteal regions and leaving the opening of the parturient canal unobstructed (17). After the umbilical cord was cut and tied the child was laid on a stone originally for the purpose, von Oefele says, of seeing whether it should be allowed to live. The orders of the Egyptian king to kill the male children of the Israelites given to the midwives probably had some precedent, perhaps like the Spartan custom, in a more savage age.

The Hebrews according to the revised rendering of the Old Testament used birthstools (Ex. 1. 15-19). It seems to have been a substitute for the knee of the husband or of the midwife, but birthstones are mentioned in Babylonian literature and Jastrow (18) insists that is the correct rendering of the word in the Bible, similar to the stone upon which the women of the Semites still squat in Palestine while giving birth to a child. One may well conjecture, though the critics pass it over, that there is some reference to birthstones in Hesiod (19). It seems a protest against some old custom:

> "Set not a twelve day boy or twelve month boy
> On moveless stones; they shall his strength destroy."

though it may have had something to do with measuring the child.

We need no link of a pictorial kind to convince us whence the Greeks derived their midwifery, even if they largely manufactured their own medical theories and religious doctrines. A perusal of the books of the Hippocratic Corpus on the *Diseases of Women*, on *Generation*, on *Sterile Women*, will reveal to the critical reader many passages that are parallels or almost copies of some of those to be found in the Egyptian medical papyri now in our hands. The description of the operation of subfumigation, i. e., fumigation of the womb socalled, we recognize as of Oriental origin. Herodotus says (20) some such procedure was practised by man and wife after coition among the Babylonians and in the Egyptian records of gynecological treatment we find the same technic as we find in the books of the Hippocratic collection; so also as to the use of pessaries. Ordinarily we should not take too literally the conventional conception of the transmission of culture from one civilization to another. It resembles too closely the modern man's thought of how an idea is put in a book which is put on a steamer and is thus transmitted direct from Berlin or Paris to New York. The process was not so simple as that, but we are permitted at least to believe that very much the same ideas prevailed and very much the same technic was used in obstetrics and gynecology in the basin of the Mediterranean and its hinterlands by the practitioners of the ancient civilizations there.

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CHINESE OBSTETRICS.

A Chinese Household Manual of Obstetrics.—J. Preston Maxwell, of London, and J. L. Liu, of Peking (*Annals of Medical History,* June, 1923), contribute an interesting article on a book picked up by them, which it is said was written by a Chinese scholar in 1661, dealing with the practice of obstetrics in China at that period.

The work is divided into two parts: The first opens with a general statement, briefly discusses life in general, and then takes up the question of labor; things to be avoided; false pains; and ends up with a few case histories. The second part covers sections on the fetus; food for the pregnant; abortion; the puerperium; stillbirth; retention of the placenta; lack of milk; and ends up with maxims and prescriptions. The author is much concerned about false pains and insists that the woman must, 1, sleep; 2, bear the pain; and 3, let the confinement proceed slowly—advice not at all out of place today.

The patient is not to walk about too much and get exhausted, but should try to get as much sleep as possible. She should lie on her back so that the child may rotate easily, and it is pointed out that when the mother is lying down, so also is the child. The following are given as indications of the time when it is right and proper to bear down:

1. The presenting part is really pressed on the perineum. 2. All the joints are loosed. 3. The chest is depressed. (Presumably the meaning is that the uterus had descended.) 4. There is a heavy dragging sensation in the abdomen and back. 5. There is frequency of urination and defecation. 6. There is gleam of the eyes. The author is specially insistent on noninterference.

As to the general care of the fetus, the writer forbids intercourse in pregnancy, advises moderate exercise for the mother, and the view is put forward that abortion is rarer in country women than among the rich, because the former have strong bones and muscles from exercise. He advises an abdominal belt seven inches wide to support the wall during pregnancy, and states that the patient is to be careful to sleep on both sides so that the fetus may become used to both positions. As to diet, the pregnant woman ought to have thin, soft, light food, but he states that this has to be modified for the rich as they will not stand it.

During pregnancy the Chinese physician forbids the patient to see all cruel and wicked things, the digging of foundations, the commencing of buildings, and turtles or rabbits.

Concerning abortion, he insists that it is not to be disregarded. He considers it a more serious condition than normal labor. The most fatal cases are due to careless aftertreatment. He calls sepsis weakness of blood and gives as its symptoms fever, a flushed face, red eyes, great thirst, and restlessness. If it is mistaken for a feverish cold and cooling medicine is given, the patient will certainly die. With regard to the puerperium, directions are given as to the posture of the patient after labor. She is not to be allowed to fall into too deep a sleep, draughts are forbidden, and a routine drug of boy's urine and wine is to be taken for three days.

The author is quite emphatic that the question of having a boy or girl depends entirely on the husband, but he gives no reason for his views. He mentions the killing of female infants to deprecate it.

The following indications of the death of the child *in utero* are given: 1. Flushed face and blue tongue on the mother's part indicate that the mother will live but the child is dead. 2. Bluish face and flushed tongue on the mother's part indicate that the mother will die but the child will live. 3. Bluish face and blue tongue on the mother's part indicate that both mother and child will die."

Some of the prescriptions given are very quaint. A few are given below.

Purple wine. For backache during pregnancy.
Black bean q.s.
Wine, 1 bowl. Take as decoction in the morning.

Yü Feng San 愈風散 For convulsions in the puerperium, shock, diarrhea and vomiting.

Ching Chieh Hsü 荆芥穗 Three drams salvia plebia.
Boy's urine q.s.

Kai Wei Kung Kwei T'ang 加味芎歸湯. For stimulating the fetus.

Tang Kwei 當歸 One ounce Japanese root, ligusticum acutilobum. Chinese root, angelica anomala.

Chuan Kung 川芎 Seven drams conioselinum univittatum.

Kwei Pan 芡寔 Back of turtle, about a hand piece, baked with vinegar and ground to powder.

Editorial Articles

PROBLEMS IN OBSTETRICS

The practice of obstetrics is replete with problems, some of which have been solved, some partially solved, and others yet unsolved. As a rule, in civilized countries obstetrical practice is not particularly successful, not nearly so successful as it should be. Dr. Thomas Watts Eden, of London, in an address delivered in New York before the alumni of the New York Lying-in Hospital on March 2d last, pointed out that the average mortality rate in Great Britain is still about five in every thousand births; and that during the past ten years, this mortality rate has remained stationary, showing little or no improvement.

In this country matters are but little better. According to Dr. W. W. Chipman, professor of obstetrics and gynecology at McGill University, writing in the *Canadian Medical Association Journal* for June, the causes of this high maternal death rate are not far to seek.

Dr. George M. Boyd, of Philadelphia, made the statement recently that nine tenths of all mothers in America receive no antenatal care; that forty per cent. of the women of this country are attended by midwives or unqualified medical practitioners; that the general mortality in childbirth is second only to that from tuberculosis, and that nearly half of the deaths are due to sepsis. Similar conditions prevail in Great Britain in which country antenatal care is in its infancy, although its great importance is beginning to be realized, and more than half the mothers are still delivered by a midwife.

Chipman is of the opinion that if obstetrical practice is to advance at all, it must be along the lines of preventive medicine and this progress may be defined in the following terms: 1, Definite antenatal care; 2, hospital segregation of the complicated cases: 3, simple, efficient technic during labor; 4, postnatal care.

In a pamphlet published a short time ago written by Sir George Newman, chief medical adviser to the British Ministry of Health, dealing with the new methods of practising medicine, it was pointed out that these methods are or would be mostly of a preventive character. The point was stressed in this pamphlet that the safeguarding of the expectant mother was one of the most important planks of this platform, as was also the proper postnatal care of mother and child. Newman appears to be in complete accord with Chipman as to the lines along which obstetrical practice should proceed, and he sketched what he thought an ideal plan for carrying out these greatly needed reforms in this direction. Among the reforms suggested was the establishment of maternity centres in all parts of the country. Moreover the medical adviser to the British Ministry expressed the hope that most of these reforms would come to pass, but he emphasized the selfevident fact that medical education must also be subjected to change in order that practice along these lines might be conducted as it should be. Up to the present time, as a rule, medical students in this country, and presumably in Great Britain also, have not been thoroughly trained in obstetrics. Therefore the first step in bringing about reforms is to render the education of the medical student more thorough in this respect.

Chipman draws attention to a point which is frequently overlooked, namely, that it is essential to bear in mind that in ninety per cent. of all cases, labor is spontaneous, and that, at any rate under existing conditions, a vast proportion of mothers must always be delivered in their own homes. The well trained medical man and nurse must be sent to them and a well adapted and efficient technic must be provided in their own homes.

Sir George Newman and Mr. Chipman, in fact all obstetricians, are agreed as to the necessity for raising the general standard of training for furnishing men more thoroughly equipped and after this has been done ways and means must be devised whereby these higher standards of obstetrical practice must be enforced.

For the benefit of the poor, maternity centres must be provided and, this is most important, the doctor and the nurse must be paid a living wage. Nowadays money is spent lavishly in all directions, but prevention of disease and the saving of mothers and infants in particular is neglected. The public need to be educated regarding the value of measures to eradicate disease and to save and safeguard life and health. Whatever the individual is ignorant of he is indifferent to, and therefore until public opinion is educated to appreciate the value of maternity work, the Government is not likely to aid its progress from the public funds. When public opinion voices itself in favor of maternal and infant welfare being carried on adequately, then and not until then will sufficient money be forthcoming for this purpose. Happily there are signs that public opinion is veering this way.

EARLY DIAGNOSIS OF CANCER OF THE UTERUS

The early diagnosis of uterine cancer is an important question in medical practice, and of all cancers that of the uterus lends itself best to active treatment, upon condition that it can be dealt with as nearly as possible at its onset. Many women with bloody discharges, however, neglect to consult a physician, attributing their trouble to menstrual disturbances, while physicians often reject the diagnosis of cancer when young women present hemorrhagic accidents on account of the apparent excellent health of the patients. The diagnosis of uterine cancer is frequently delayed because of the thread worn idea that its symptoms include hemorrhage, pain, fetid discharge, and a cachectic look. In truth, when these symptoms have declared themselves, the disease is already far advanced.

The first distinctive symptom of the onset of uterine carcinoma is hemorrhage and indicates immediate biopsy. While the characteristics of the hemorrhage are varied, they nevertheless offer some interesting peculiarities. They are irregular and sudden in appearance, coitus or the cannula of a vaginal douche being enough to bring them on. Sometimes they take the form of persistent oozing.

Hemorrhage is also the first and only symptom of epithelioma of the uterine mucosa at its onset and is accompanied by hypersecretion of the glands, which may be considerable. Continued and repeated loss of blood during the intervals of menstruation, no matter at what age, is the first manifestation of carcinoma, while any hemorrhage occurring after the menopause is suspicious and requires a careful examination of the genital apparatus. Unfortunately, at the onset the physical signs are absent, so that one is likely to attribute the hemorrhage to anything but carcinoma.

In the initial phase of cancer of the cervix the examining finger will encounter irregular projections on the surface of the cervix which are less distinctly defined than Naboth's glands and are hard to the touch. Sometimes the cervix is rigid and hard, as if starched, and when an attempt is made to raise up the cervix an effusion of blood ensues—an important diagnostic sign. Inspection reveals a gaping cervix, bright red in color, with small, irregular bosses. Any direct contact will cause bleeding.

It is still more difficult to diagnose cancer of the corpus uteri, which is generally met with in advanced life and in virgins. There is an almost continuous abundant bloody hydrorrhea. Any form of trauma will result in hemorrhage, but the most important evidence of cancer of the corpus uteri is an increase in the size of the organ, at a time of life when atrophy should have taken place. By compressing the fundus a pinkish fluid will be expelled. If a positive biopsy is found, it is decisive, but should the result be negative, it is not convincing, and if the loss of blood persists, clinical considerations should outweigh laboratory findings.

In some women near the menopause abundant metrorrhagias, of the menorrhagic type, occasionally coincide with menstrual irregularity, this symptom being due to old parenchymatous metritis or hypertrophic uterine sclerosis. Syphilis of the uterus may be the cause and all disquieting symptoms may subside if active antisyphilitic treatment is instituted. In some, high blood pressure and cardiac, renal, or hepatic morbid changes are the cause of the loss of blood, and these should be searched for clinically.

Polypous or villous metritides are readily recognized, but certain cancers affecting the polypous type have a large surface of implantation and project through the cervix in the form of a vegetative mass. Senile metritis and uterine cancer may be easily confounded, if only the clinical signs are relied upon, so that microscopical examination of the uterine mucosa must be made.

All things considered, the prophylaxis of uterine cancer rests entirely upon the judicious interpretation of the initial hemorrhage, and any loss of blood occurring during the interval of the menses, if presenting a tendency to be prolonged, frequent, and above all continuous, should exact a thorough examination of the patient.

THE CENTENARY OF MEDICAL JOURNALISM

The first medical weekly journal published was the *Lancet,* which on October 5th last had been in existence for one hundred years. It was issued in London on Sunday, October 5, 1823, by a medical practitioner who had not written previously a line in his life. Thomas Wakley, the man in question, had qualified in medicine recently, was devoid of literary experience, had no particular social standing, no powerful backing, and it seemed as if he had undertaken a hopeless task in his new adventure. But he was impelled by that strong driving force, a personal grievance, and withal possessed sufficient restraint to forbid the feeling to lead him astray. He used the flame which burned in his own breast to excite his energies to introduce reforms into the medical profession in order that others should not suffer in future in the same manner as he had suffered.

With this end in view the first English medical editor worked as a man with but one aim in life, to remove medical abuses. In 1823 his field of work, in this respect, was wide indeed. At that time the medical student in London, or in fact in any part of Great Britain, unless he had money or interest, had small chance of obtaining a satisfactory medical education, and merit had little to do with progress in the profession. The medical profession was unorganized, or slightly and badly organized, and medical education, and to a great extent, the making or marring of a practitioner, rested largely with the honorary staffs of the hospitals. These lectured, examined, and were officers of the Royal College of Surgeons, which body was regarded, at any rate by the profession of London, as the controlling power in medicine, whose word was law. In New England, at the same period, the medical profession was run on similar lines; there was a privileged class and favoritism was rampant.

During the first ten years of the *Lancet's* precarious existence, Wakley was the stormy petrel of medical politics, and devoted his journal to fighting the privileged classes of medicine with every weapon at hand. He attacked them in every possible way, pillorying them before the rank and file of the profession and the general community as betrayers of the public charities, the hospitals, as examiners who drew fees for ineffective and perfunctory work, and as clinicians and lecturers who, as a rule, were beneath contempt.

These men were so strongly entrenched in their privilege, which had become hoary by long custom, that to storm successfully their citadel required unfailing courage and indomitable tenacity. Wakley, who revelled in a fight, possessed such qualities, and finally by his election to Parliament soon after the passage of the first Reform Bill, he transferred the chief scene of action to a place where the aid of legislation could be invoked in his fight for fair play. In 1846 Wakley brought in a bill for amending the law relating to the practice of medicine in Great Britain and Ireland, based on the experience he had gained as an editor. This bill was most certainly his greatest parliamentary triumph, and if he had accomplished nothing else, would serve as a fitting monument. While it had no direct results, as it did not pass, it was the means of the Medical Reform Act of 1855 becoming law, an act which was obviously modelled on Wakley's draft of 1846 in many essential details and which revolutionized the practice of medicine in Great Britain and gave to it its present high professional status.

The first years of the *Lancet* were stirring ones and represented the energetic character of the founder. He was largely instrumental, by virtue of his own personality and the influence of his journal, the vehicle of his views, in immensely raising the standard of medicine. The *Lancet* throughout its history has fulfilled the avowed object of Thomas Wakley and has recorded in its pages all events connected with medicine, surgery, or medical science. Sometimes it has led and sometimes followed, but no striking happening in the medical or surgical world has escaped publication in its columns.

The domestic history of the *Lancet* has been peculiarly fortunate. During the past one hundred years there have been only five editors, all of them Wakleys, except the present able editor, Sir Squire Sprigge, who has held the post for fifteen years.

The history of the *Lancet* is the history of modern medicine. It has moved with the times and yet with a discret conservatism altogether in keeping with British character and tradition. In honor of the occasion a special centenary number of the journal was issued on October 6th, a number well written, well illustrated and well "got up" generally, which adequately commemorates the foundation of the *Lancet* and of modern medical journalism. We greet the green old age of our distinguished contemporary.

NECROBIOSIS OF UTERINE FIBROMATA

It may be said that two types of gangrene arise in uterine fibromata. The first, which belongs especially to exposed fibroids, that is, polypi and submucous fibroids, is due to infections and not to ischemia. It manifests itself by a fetid secretion which may be the starting point of septic complications.

The second type of necrobiosis, formerly called aseptic necrosis, takes place in unexposed interstitial fibroids. It is due to ischemia resulting from strangulation of the neoplasm by its capsule which has become too tight from rapid growth of the tumor, while other observers suppose that it ensues from thrombosis of the veins of the capsule. Bégouin is of the opinion that necrobiosis results from an occlusion of the terminal and single artery, an anatomical condition of some frequency.

When the clinical picture of necrobiosis is complete, a condition not at all uncommon, aseptic necrosis manifests itself by a veritable symptomatic triad, the first of which is pain, often beginning with an acute paroxysm in the lower abdomen which renders it necessary for the patient to go to bed. The condition might easily be taken for a pelvic peritonitis or torsion of the pedicle of an ovarian cyst. This acute paroxysm lasts from three to ten days and then subsides, leaving more or less marked sensitiveness of the tumor, which is increased by pressure.

Should the acute attack be wanting, the patient will complain of spontaneous sensitiveness or pain on pressure.

The second symptom is a sudden increase in the size of the growth, frequently noted by the patient herself when the process consists of a single large fibromatous nodule. On the other hand, the increase in size may not be noticed if there are several nodules, only one of which sloughs. The tumor undergoes softening at the same time it becomes necrobiotic. Thirdly, there is, in most instances, a pronounced change in the general health of the patient at the onset of the attack of pain, with a temperature reaching 108°F. or more. The skin assumes the yellow tinge of sepsis. In some larvata cases, there may be pain only on pressure over the growth.

All this goes to show that the diagnosis is not always an easy matter and must be differentiated particularly from septic sloughing and cancer. On the other hand, one must eliminate peritonitis, torsion of the pedicle of an ovarian cyst, or even rupture of an ectopic gestation. The prognosis, which is less immediately bad than in septic gangrene, nevertheless, can not be regarded as benign when a correct diagnosis leads to immediate operation. Surgical intervention is usually not more serious when there is necrobiosis than in cases of uncomplicated fibroids. The only danger is delay in operating. Hysterectomy is the only rational procedure.

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News Items.

Dr. Lorenz's Latest Plans.—Dr. Adolf Lorenz, of Vienna, has resumed the practice of orthopedic surgery at 346 Lexington Avenue, in association with Dr. Dexter D. Ashley, with Dr. Albert Lorenz and Dr. Joseph Nevins as assistants.

Real Medical Library Used in Play.—In *Laugh Clown Laugh,* Lionel Barrymore's new play which is produced by David Belasco, the first act takes place in the office of a nerve specialist. Mr. Belasco's realism is demonstrated by the fact that the library of the physician's office is composed of real medical books furnished by Paul Hoeber, Inc. This was previously done by Mr. Belasco in a Broadway production entitled *The Boomerang,* the medical library being supplied from the same source.

Tuberculosis Conference Well Attended.—The second annual New York City tuberculosis conference was held in the New York Academy of Medicine, and was attended by a large number of physicians, nurses and social workers, as well as by representatives of city and State departments having to do with public health. Bird S. Coler, Public Welfare Commissioner, presiding at a session, stressed the importance of educating the public and declared that the same zeal should be shown for tuberculosis patients as is manifested in the case of some great disaster.

Dr. Charles Fama Honored.—Dr. Charles Fama, examining physician of the United States Pension Board, was the guest of honor at a dinner given in recognition of his services to New York and the country. Police Commissioner Richard Enright, of New York, was toastmaster.

National Social Hygiene Conference Held.—The annual national social hygiene conference under the joint auspices of the American Social Hygiene Association and the Missouri Social Hygiene Association, was held from November 5 to 7, 1923, at the Hotel Statler, St. Louis, Mo.

Second Harvey Lecture.—Dr. Walter R. Bloor, professor at the University of Rochester School of Medicine and Dentistry, delivered the second Harvey Society Lecture at the New York Academy of Medicine on Saturday evening, November 3, 1923. His subject was The Utilization of Fat in the Animal Body.

Dr. Banting and Dr. MacLeod Win Nobel Prize for Discovery of Insulin Treatment.—The Nobel Prize for medicine for 1923 has been awarded to Dr. F. G. Banting and Dr. J. J. R. MacLeod, of Toronto, for their discovery of insulin. These physicians are the fourth and fifth North Americans to be honored by the award of Nobel prizes for scientific achievements.

Dr. Bentz Opens Buffalo Section of Pathology.—The first regular meeting of the Section of Pathology of the Buffalo Academy of Medicine for the year 1923-24 was held Wednesday evening, October 24th, at 8:45 p. m., at the Hotel Statler, Buffalo. Dr. Charles A. Bentz, of the Buffalo Department of Health and of the faculty at the University of Buffalo, read a paper entitled Studies in Diphtheria.

Russian Medical Journals at New York Academy of Medicine Library.—The Russian Public Health Service, with offices at 18 East Forty-first Street, announces that they receive regularly medical publications from Russia and that Russian physicians, as well as American health agencies who wish to make use of these publications, are invited to do so. They are all filed in the New York Academy of Medicine library.

American Electrotherapeutic Society Officers Elected.—At the recent annual meeting of the American Electrotherapeutic Association, September 18th to 21st in Atlantic City, Dr. Sinclair Tousey, of New York, was elected president; Dr. Frank E. Peckham, of Providence, R. I., and Dr. Frederic de Kraft, of New York, trustees; Dr. Richard Kovacs, of New York, was reelected secretary, and Dr. J. Willard Travell, of New York, treasurer.

Association for Control of Cancer Organized.—The American Association for the Study and Cure of Cancer has been organized in the New York Academy of Medicine. This new organization embraces over sixty charter members enrolled from eighteen different States as well as from other counries. At the first meeting on October 12th, Dr. L. Duncan Bulkley was elected president; Dr. Curtis Frank Claassen, of Brooklyn, vice-president; Dr. A. Hirst Appel, Colonel in the Medical Corps, United States (retired), secretary and treasurer; with an executive committee of five. The next annual meeting will be held in Chicago in May, during the meeting of the American Medical Association.

Foreign Correspondence.

LONDON LETTER.

(*From our own correspondent.*)

LONDON, *August 8, 1923.*

THE CHILD WELFARE CONFERENCE IN LONDON.

The Conference on Child and Infant Welfare, held in London a short time ago, was well attended and some remarkably good papers were read. One of the main subjects of discussion was the maternity question. Childbirth in this country is in a very unsatisfactory condition. A recent pamphlet written by Sir George Newman, chief medical adviser to the Ministry of Health, and issued by that body, referred to this branch of medicine or rather surgery, and points out that reforms are urgently called for, not only in the practice of obstetrics but in the teaching of the same.

MATERNITY HOMES.

A paper on the value of maternity homes in a maternity and child welfare scheme was presented by Dr. W. Allen Daley, and Dr. A. Leyland Robinson, in which they discussed the precise value to maternity and child welfare schemes of the small maternity home of from six to twenty-five beds. It is pointed out that the object of these homes is to bring about a reduction in maternal mortality as well as a decrease in antenatal, intranatal, and neonatal mortality. The Ministry of Health official figures showed that there has not been the reduction in maternal deaths from sepsis or other causes associated with childbirth that has characterized the general death rate, the death rate from infectious diseases, or the infant mortality rate, but remains approximately what it was twenty-five years ago. There was no evidence of reduction in the number of stillbirths. Causes of maternal mortality might be thus analyzed: 1, Sepsis, 1,171 deaths in England and Wales in 1921; 2, toxemias, 604 deaths in 1921; 3, shock or mechanical difficulties; 4, hemorrhages, 469 deaths in 1921, two fifths being due to placenta previa; 5, intercurrent diseases. Another large group of deaths, 262, were due to puerperal embolism and sudden death.

PREVENTABLE DEATHS IN CHILDBIRTH.

The paper went on to say that at a conservative estimate there were over two thousand preventable deaths of mothers in childbirth every year, associated in the main with lack of skilled assistance when needed in pregnancy and after childbirth. There were relatively few deaths in the Metropolitan Boroughs and comparatively many in the County Boroughs of the north of England, where maternity hospital facilities were notoriously lacking. For every woman who died of puerperal sepsis, four were seriously ill or just recovered. Dr. Gardley Holland reported to the Ministry of Health that fifty-two per cent. of the fetal deaths investigated by him were preventable. A study of statistics indicated that a considerable number of deaths of infants under one month could be prevented. Undue prolongation of labor was a frequent cause of neonatal death, and a large proportion of such deaths were also due to prematurity. The prevention of maternal deaths would also prevent many deaths of infants. The most important cause of these preventable deaths was ignorance on the part of expectant mothers that antenatal care was necessary. Many midwives and even doctors appeared to be obvious to the need for taking a full history and examining carefully the women who book them for their confinements. In the opinion of Dr. Daley and Dr. Robinson, the best method for creating a demand for antenatal supervision was to establish a clinic for expectant mothers to which midwives could send their patients and where private doctors could obtain a second opinion in difficult cases. Such had been the genesis of many maternity homes, the demand for which had been enormously strengthened by the prevailing housing shortage. Moreover, not only are an adequate supply of maternity homes required but attention is drawn to the fact that as fifty to ninety per cent. of expectant mothers in the English industrial areas consulted a midwife first the efficiency of the outside midwifery service and the attitude of midwives towards maternity homes was all important. The standard of the practising midwife was steadily rising in England, and there was great reason to hope that the newer type of midwife would realize the importance of preventive antenatal work. Cooperation between midwives and the antenatal centres must be promoted by devices mutually beneficial. The general conclusion of the authors was that the Ministry of Health's recommendation that small maternity homes be instituted was wise.

MATERNITY CONVENTION.

Miss Margaret G. Bondfield read a paper on the Maternity Convention, in which she said: "The Maternity Convention provides that a woman employed in industry shall, for six weeks before and six weeks after confinement, be set free from work, be paid benefits sufficient for the full and healthy maintenance of herself and child, and be entitled to free attendance of a doctor or certified midwife, and in a case where she is nursing the child, shall on resuming work be allowed half an hour twice a day during her working hours for this purpose." Miss Bondfield pointed out that the causes militating against healthy motherhood appeared to be, 1, inadequate wages; 2, lack of knowledge regarding maternity, and of skilled advice and treatment; 3, the personal relation of husband and wife.

At the Washington Convention in 1919, the findings on the maternity resolution were not unanimous, a minority report taking exception to the antenatal provision in regard to work. namely, "the right to leave work six weeks before confinement," but was subsequently defeated. This first international charter of motherhood was carried by more than the necessary two thirds majority, and has since 1918 been ratified by eleven countries, among which Great Britain is not. In the view of Miss Bondfield the position of Great Britain is indefensible. The government indicated its objection to be that a ratification would tend to cut across the health insurance and factory acts, and that adequate provision was made under the existing law. But, according to Miss Bondfield, on severe examination each argument of the government breaks down. Actual examination of figures showed that immense sums of money were being spent already under the existing legislation, and the proposals of the convention, if linked up in some way with the provisions of the national insurance acts, would not be too costly, even in these times.

CHRONIC TOXEMIA AND INSANITY.

That there is a relationship between chronic toxemia and certain forms of instanity has been the opinion of some well known medical men for a considerable time. William Hunter was the first to call attention to chronic sepsis. He especially indicated oral sepsis as the cause or the main factor in the causation and development of many chronic diseases and conditions of ill health. Sir Arbuthnot Lane is another authority, who several years ago stigmatized intestinal toxemia, arising from long continued intestinal stasis, as the cause, directly or indirectly, of many diseases, among which were included cancer and some forms of mental disorder. Dr. William Ford Robertson, late pathologist to the Scottish Asylum Board, who died recently, during the last few years of his life took the deepest interest in the problem of physical causes of insanity and devoted a great deal of his time to investigations in this direction with regard to dementia precox. He seemed to be quite of the opinion that the most reasonable cause of this form of mental aberration was an infection and of the modes of infection he thought that infection of the intestinal tract was the most likely. The death at a comparatively early age, fifty-five, of Dr. Ford Robertson is greatly to be deplored. He was an original thinker and a patient investigator, one not likely to be led astray by a will o' the wisp, and therefore his opinions were especially valuable. It is to be regretted that he had not lived to carry his researches further.

Another Dr. Robertson, Dr. White Robertson, of London, has been pursuing investigations on somewhat similar lines and has just finished, in a paper to the *Practitioner,* for August, the results on some of the surmises suggested to him by investigations into the possible connection between intestinal stasis and epilepsy. These investigations appear to convey to him the view that there is or may be such a connection.

Still another British alienist who has been making investigations, clinical and otherwise, in the same direction, is Dr. Graves who is in charge of an asylum in Birmingham. He also seems to be favorably disposed to take the view that chronic sepsis plays an important part in the causation and development of mental disorders of a certain kind.

On July 11th last, Dr. Henry A. Cotton, medical director of the New Jersey State Hospital, Trenton, read a paper on chronic sepsis in mental disorders, before the British Medico-Psychological Society in London. In this paper Dr. Cotton narrated his experience in treating mental patients from the point of view that they were suffering from chronic sepsis. His experience and those of his colleagues were highly favorable to the view that septic foci were responsible or largely responsible for the mental symptoms, as on the removal of these the percentage of cases of recovery at Trenton more than doubled. Dr. Cotton's paper has aroused much interest among psychologists and those concerned with investigations into and the treatment of mental disorders here.

ROCKEFELLER MEDICAL FELLOWSHIPS.

The Medical Research Council has announced recently the award of Rockefeller Medical Fellowships, tenable in the United States of America during the academic year 1923-24, to the following: John Crighton Bramwell, M.D., Camb., M. R. C. P. medical registrar and registrar to the cardiographic department, Manchester Royal Infirmary; Norman McOmish Dott, M.B., Ch.B., Edin. F. R. C. S. Edin. assistant in the physiological department, University of Edinburgh; Helen Ingleby, M.B., B.S. Lond. M. R. C. P., assistant physician to Victoria Hospital for Children and South London Hospital for Women; Hugh Kingsley Ward, M.B., Sydney, D. P. H., Oxf., member of the scientific staff of the Medical Research Council and working in the department of pathology, University of Oxford.

HOUSING IN LONDON.

The housing problem in Great Britain in general, and in most of the big industrial centres in particular, is acute and the lack of decent housing facilities is responsible for a good deal of the disease, physical, mental and moral, which is prevalent. The recently published report of the 1921 census throws much light on the present housing problem. In 1911, there were in the London Administrative County 678,712 structurally separate buildings occupied, and in 1921, 716,450 or 4.1 per cent. more. It may be pointed out that the increase in the number of separate buildings occupied was covered by the reduction in the interval in the number of dwellings vacant. In 1911, 47,260 structural separate dwellings were returned as vacant while the number in 1921 was 18,969, a reduction of 28,291, or 60 per cent. There were in the area 1,023,951 private families in 1911 and 1,120,597, or an increase of 9.5 per cent. in 1921. Therefore it is obvious that the increase in the number of private families has been larger than the increase in the number of occupied separate dwellings, and consequently the average number of private families to the occupied dwellings has increased from 1.51 in 1911 to 1.59 two years ago. Of the total number of families residing within the area of the Administrative County of London thirty-eight per cent. live in single occupation of separate dwellings, while thirty-two per cent. are families living two to a dwelling and thirty per cent. are families housed in dwellings containing three or more families each. These separate dwellings are of varying size: 18.1 per cent. contain three rooms or less, 27.2 per cent. four or five rooms, 43.3 per cent. six to eight rooms, and 12.4 per cent. nine rooms or more.

London at the present time is less densely housed than in 1911. This is largely owing to the reduction in the average size of the family. The average density for the whole of the administrative county of London is .96 rooms per person, but this is a mean of variations in individual boroughs varying within wide limits.

In those districts in which the accommodation to each person is lowest, the proportion of juveniles in the population is highest. In other words, in those areas in which there are proportionately the most children housing conditions are the worst.

Also it must be borne in mind that thousands of families are living in slum areas or in unsanitary and unsatisfactory dwellings.

In some other of the industrial districts of Great Britain housing conditions are even worse. Glasgow holds an unenviable position in this respect. Owing to the high cost of building the prospects for improvement are not encouraging. Legislation to better the existing state of affairs is of a compromise character, which will render further legislation inevitable before long. The post of Minister of Health is beset with difficulties, of which the housing question is the chief.

GENEVA LETTER

(From our own correspondent.)

GENEVA, *August 25, 1923.*

IMMUNIZATION AGAINST TUBERCULOSIS

In an admirable report recently presented to the Swiss Tuberculosis Association, Prof. B. Galli-Valeiro, of the University of Lausanne, refers at length to the subject of specific immunization in tuberculosis. All who deny the possibility of such an immunization base their supposition on experimental work on the guineapig. Now, in the guineapig tuberculosis develops so rapidly and intensely that no comparison can be made with its development in man. The guineapig is extremely sensitive to experimental infection and almost refractory to spontaneous injection. Nevertheless, in this same animal laboratory men of the first order, such as Kitasato, have been able to obtain cures and immunization with tuberculin.

Others deny immunity because they have not found antibodies in the blood of animals immunized with tuberculin, but in this respect they seem to confound conjointly all the different immunities. If to admit immunity one depended exclusively upon the presence of characteristic antibodies in the blood, immunity must be denied in many diseases and thus renounce the use of many curative and prophylactic sera. Therefore, notwithstanding those solid immunities observed in vaccination for hydrophobia and variola, the antibodies are extremely scarce in the blood. This applies also to antianthrax serum which acts perfectly although devoid of bacteriolysins. There are still many points in the phenomena of immunity which escape us, and it is impossible to include all cases of immunity in the same class. In this respect Galli-Valeiro accepts Petruschky's opinion rather than attempt to establish immunity exclusively on the verification of specific antibodies, which would expose one to serious mistakes.

In tuberculosis the immunizing substances appear—according to Wolff-Eisner, Wassermann and Neufeld—to be seated in the tissue of reaction which develops around the tuberculous focus, so then the bacillus is, so to speak, isolated from the rest of the organism on which it no longer exercises any action. Hence it is not blood immunity but cell immunity which plays the most important part in the defence of the organism against tuberculosis. This is also demonstrated by the fact that a strong maternal immunity is not transmitted to the products of conception.

This does not imply that no antibodies are to be found in the blood of tuberculous subjects or individuals immunized against the disease, because Römer, although unable to verify *in vitro* the presence of bactericidal substances in the blood of strongly immunized sheep, Behring, Vallée, Much and Leschke and Sata have demonstrated that the blood of strongly immunized animals can protect other animals from tuberculosis.

The blood of tuberculous subjects contains specific substances fixing the complement and Galli-Valeiro has shown that in several cases these substances increased by treatment with tuberculin. Likewise the changes occurring in the opsonic index, agglutination and specific precipitation in tuberculous patients treated with tuberculin or emulsion of bacilli, speak in favor of the formation of a certain quantity of antibodies capable of being thrown into the circulation, although the greater part remains localized in the cells surrounding the tuberculous focus. It is also this insufficiency of circulating antibodies that so far has prevented the production of sufficiently active antituberculosis sera.

Although it is quite possible to produce immunizations with tuberculin, because this substance appears to be endowed with the power of liberating active substances of the tissue of reaction around the tuberculosis foci, and in certain animals to provoke the formation of circulating specific antibodies—a fact confirmed by Löwenstein and Pickert, Hamberger and Monti, even in tuberculous human subjects treated with tuberculin—Galli-Valeiro believes that one should attempt to obtain for specific immunization against tuberculosis an antigen containing all the active principles of Koch's bacillus, in as pure a state as possible. For that matter, this is the principle upon which is based all modern vaccinations, excepting those resulting from bacteria having a filtrable toxin, such as diphtheria, tetanus, and botulism.

Consequently, taken by itself, although helping much, tuberculin cannot solve the problem of specific immunization against tuberculosis. The emulsion of bacilli already represents an enormous progress, because it contains all the component parts of the bacillus; however, the true solution will not be found until it has become possible to obtain absolutely attenuated cultures that are unchanged in so far as their antigen power is concerned. For that matter, this is the principle which has directed the numerous attempts of antituberculous vaccination in cattle.

To attain the desired end one may resort to: (1) Spontaneously attenuated bacilli, such as the acid resistant or bacilli of coldblooded animals. Unfortunately, these forms do not appear to possess much value in respect to mammalia, as far as antigens are concerned, and, judging from experiments now being carried out by Galli-Valeiro and Bornand, large doses, lysed in the organism, may even produce death from intoxication.

(2) Human bacilli attenuated by successive strains through coldblooded animals. This is the principle of antiphymatol and Friedmann's vaccine, an excellent one, because it is derived from variola vaccination, experiment antirabic vaccination, etc. But it is not certain that this procedure will result in perfect attenuation and moreover it is doubtful whether or not Friedmann's baccillus is an attenuated Mycob. hominis, rather than a bacillus special to the turtle.

(3) Human bacilli attenuated by different procedures. This is the method followed at present and probably brings us nearer to the desired result by producing vaccines offering the required properties, namely, devoid of danger yet capable of producing immunization. This is the method employed by Shiga with tryptaflavine vaccines, Moro with Eletebine's ointment, Selter with cultures heated at eighty degrees centigrade with phenol at 0.5 per cent. (vital tuberculin), Raw with cattle and human vaccinations with cultures attenuated by age (stub cultures renewed since 1906) and Calmette and Guérin's bile cultures.

Therefore, the solution of the problem is in sight, although for the present one must not be indulged in too much optimism.

LETTER FROM THE CANAL ZONE

(*From our own correspondent.*)

BALBOA HEIGHTS, *October 1, 1923.*

MEDICAL ASSOCIATION OF THE CANAL ZONE.

The Medical Association of the Isthmian Canal Zone held its 198th meeting in the Administration Clinics Building of Ancon Hospital on May 18, 1923. Dr. J. L. Byrd, the health officer of Cristobal-Colon, presented A Résumé of the Antimalarial Campaign at Cristobal-Colon, 1917-1922, and Dr. D. P. Curry, the assistant chief health officer, gave a lantern slide demonstration of the field work of the division of sanitation. Dr. Byrd pointed out that Cristobal-Colon, once known as one of the most unhealthy seaports in the world, is situated on Manzanillo Island near the Atlantic entrance of the Panama Canal. The island was once a tidal swamp but has been largely filled. In 1905, General Gorgas and his coworkers eradicated yellow fever from this area and by 1917 the antimalaria campaign had been extended to about half a mile from the inhabited section. This belt was made thoroughly sanitary, all vegetation being kept closely trimmed, the swampy areas either filled or drained, and the drains oiled at regular intervals of seven days. This eliminated anopheles breeding from Manzanillo Island and the adjoining Mt. Hope district. Nevertheless, malaria continued.

On investigation it was found that countless numbers of anophelines were being bred in the extensive swamps which surround the city on three sides and during 1917, 1918 and 1919 appeared in such quantities on the screens at Colon Hospital and the Washington Hotel at the beginning of the rainy season and for the following three months that it was necessary to detail a laborer to kill them with larvacide applied by a knapsack spray. These mosquitoes came from the swamps two miles distant across Manzanillo Bay, a mile of open water. Flight observations clearly indicated that they would fly against an eight mile breeze for a distance of two miles. The drainage of these swamps by sealevel canals in 1920-21 did away with this annual visitation of anophelines. Very little oil was used in controlling mosquito breeding in the swamps in question. Trochas (paths) six feet wide were cut through the swamp at intervals of fifty yards and sea level drains about eight inches wide dug along their centre. The drains were kept free of vegetation. This method was not expensive and has proved very effective, malaria being successfully controlled and practically eradicated from Cristobal Colon.

VIENNA LETTER

(*From our own correspondent.*)

VIENNA, *August 15, 1923.*

REQUIREMENTS OF BEING A SPECIALIST.

The medical faculty, as well as the medical chamber in Vienna, have long sought to solve the question, Who can be called a specialist? The federation of Vienna specialists has been obliged to arrive at a quick decision. Nominally the mighty sick club of the state officials needed specialists. Applications were made by hundreds but only a few were considered adequate, therefore the board of directors of the sick club turned to the federation specialists asking them to recommend specialists of corresponding knowledge. The federation laid down the following rules as to the distinction of being a specialist and recognized by the federation:

1. A specialist is one who practices only in his special branch and does not deal with general practice.

2. Specialists are those who are taken up by the federation of specialists or are regarded as such by same. If a person is not recognized as a specialist by the federation he may apply to the medical economical organization for sending out a committee which is composed of two nonspecialist members sent out by the medical chamber and two specialists sent out by the federation. The president of the committee is a delegate of the medicoeconomical organization. The result of these rules was that all real specialists hastened to become members of the federation, while the unfit ones were forced by the chamber to refrain from calling themselves specialists.

THE SUICIDE RATE IN BUDAPEST.

The year 1922 has shown an increased number of suicides committed and attempted for reasons not far to seek. After her defeat in the war, Hungary has lost about half her territory, and more than half her population; there is very grave trade depression; the change of frontiers has deprived the country of a good part of its industrial markets, and has frequently interfered with family life, while the means of communication which remain are difficult to come by, and the getting passports entails much time, trouble, and expense. Even postal communication with the lost territories is uncertain; a letter travelling ten miles from Hungary into Roumania takes a week or so, owing to the prevailing system of censoring the letters. Under these conditions it is not to be wondered at that the number of suicides in the past year amounted to 516, 10.5 per cent. more than in 1921; of these 368 were men, 142 women and 6 juveniles (three children). The suicides of juveniles are increasing in frequency; The youngest of these six juveniles was eleven, the oldest fourteen. The causes appeared to be desperation at loss of parents and cruel treatment by employers. The oldest person who killed himself was ninety years, the highest number of suicides was 107 in November and ninety-four in December.

Book Reviews

RECENT FRENCH MEDICAL BOOKS

Traité de physiologie médico-chirurgicale. Par Prof. Charles Richet et Dr. Charles Richet, Jr. Paris: Felix Alcan, 1921.

Précis de therapeutique des maladies de la peau. Par Thibierge et Legrain. Paris: Gaston Doin, 1922.

Physiologie Obstetricale normale et pathologique. Par Dr. Henri Vignes. Paris: Masson et Cie, 1923.

La Physiologie normale et pathologique du foie. Par Prof. G. H. Roger. Paris: Masson et Cie, 1923.

It is a striking phenomenon in England and America that book reviewers place their estimate on a foreign work in direct ratio to the number of quotations from American or English writers. The reviewer of the four books listed above is in close touch with current medical literature and his object is to present an analysis of a few recent books that are of unquestionable value and contain sufficient reference to American writers to satisfy any reviewer.

* * * *

Richet's *Traité de physiologie médico-chirurgicale* is an interesting work and is issued in two volumes, together containing 1452 pages and 141 illustrations. In this clearly written book an attempt has been made —and a most successful one—to deal with the subject of physiology from the viewpoint of its application to practical medicine and surgery, and in this lies its value. For the advanced student and the practitioner this is an immense advantage and practical to the highest degree. The science of physiology has developed to such an extent that to be complete a treatise on this subject would necessitate a work of four or five large volumes. Neither student nor practitioner can today pretend to know everything comprised in this science, so the work under consideration is elementary, the author's intention being to deal merely with the facts that are strictly necessary for the physician to know about physiology, which is the basis of medicine.

Many textbooks and systems of medicine give space to physiological experimentation, it is true. Fever, diabetes, syncope, asphyxia and inanition are studied, but these chapters on general pathology remain isolated and are unrelated to normal physiology, which should precede them. However, the study of fever, for example, is the immediate conclusion of a chapter on the physiology of animal heat. Pathology has been enlightened by physiology, and, inversely, physiology has been enlightened by pathology. Far from being discordant, these two sciences are, in reality, in perfect harmony, and those who maintain that clinical medicine and physiology are in opposition to one another certainly never understood either.

The reviewer knows of no work in any language that better fulfils the conditions named, and these two volumes should be cordially received by those who would keep abreast of the times.

The first edition of Thibierge and Legrain's eminently practical treatise on cutaneous diseases appeared in 1895, but for various reasons Dr. Thibierge refrained from bringing out a new edition until last year, chiefly because the properties of the numerous physical agents successively introduced into dermatological therapeutics seemed to him not sufficiently understood. Of late years, however, their technic has been improved and their indications have become clear, likewise their advantages and disadvantages.

In the present volume the author's aim is to present all the elements of treatment of the dermatoses and in this respect they have undoubtedly succeeded. Contrary to the majority of textbooks on skin diseases, which present the various treatments of each lesion without considering their relative value, Thibierge and Legrain have endeavored to bring into relief those methods of treatment in which they have the most confidence. Far from mentioning all the medications that have been proposed for the treatment of dermatoses, the authors have judiciously chosen those which have given them the best results.

The material is well digested and the wide experience of the authors, extending over many years should make the book of special value to those seeking authoritative advice on the treatment of skin diseases.

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Dr. Henri Vignes's *Physiologie obstetricale normal et pathologique* is unquestionably a unique and valuable contribution to obstetrical literature. The matte contained in its pages is evidently based on th author's personal researches, but he has also quote the most recent work of others on the subject, an for the first time has placed the physiology and biochemistry of gestation and labor in as perfect perspective as the present day scientific data will permit The book possesses great practical value as well as it is a clinical guide to the analysis of pathologica states arising in pregnancy and labor, as well a offering the choice of therapeutic measures appropriate in these states.

The book is divided into three parts. The firs treats of gestation and in fifty pages the author give the first synthesis of physiological and pathologica conditions observed in the endocrine glands durin gestation. In the second part Dr. Vignes present a general theory of uterine contraction and its anomalies, but it is only in the physiological and clinica study of these anomalies that one will find th indications for the use of drugs susceptible of mod fying uterine tissue and contraction. The autho insists that both anesthetics and oxytocics shoul be studied carefully and extensively. The third an last part of the book deals with the postpartu period in a most scientific and practical manner.

All things considered this is a valuable contribu tion to the science and art of obstetrics, the boo being the fruit of long and conscientious study c ample clinical material.

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La Physiologie normale et pathologique du fo is the work of a master hand. The majority of chem ical changes accomplished by the liver require t presence of glycogen, as Roger demonstrated as f back as 1886. This correlation is easily explained the formation of glycoside transformed by oxid tion into a conjugate glycuronic acid. In combinin with sugar a poison loses its toxic properties and is easily eliminated by the kidneys. Glycogen is not ess useful in a great many other manifestations of hepatic activity, and hence establishes a certain correlation between various functions of the liver. There are also intimate correlations between the liver and other glands, a coordination being assured either by he nervous system or the endocrine glands. These functional synergies explain a large number of morbid sympathies.

Glycogeny, that is to say, the accumulation of glucose in the form of glycogen and the excretion of glycogen in the form of glucose, is governed by a triple mechanism, viz., a nervous mechanism made evident by pricking the fourth ventricle; a humoral mechanism, intervening whenever a change in the sugar tenor of the blood occurs, and a third, hormonal in nature, explaining the influence of the pancreas, suprarenals, hypophyses and thyroid on glycemia and the development of the glycosurias. The study of the normal and pathological physiology of the liver comprises the majority of the functions of the organism and reveals the constant interference of the liver in most of the transformations to which organic matter is subjected.

The eminent author makes no pretention of having written a complete treatise on the liver, but he has attempted to show that considerable progress has been made during the past few years, yet for all that the *éclat* of modern discoveries has not dispelled all the obscurity by which the subject is surrounded.

GYNECOLOGY

Aids to Gynecology. By Richard E. Tottenham. New York: William Wood and Company, 1923. Pp. vii-128.

In this the sixth edition a number of sections have been reprinted almost unchanged. The whole subject of gynecology is treated in mere outlines, very briefly and very conservatively—almost too much so to be of value to any one except perhaps a third year medical student.

OCULAR SYMPTOMATOLOGY

Séméiologie Oculaire. Par Félix Terrien, Professeur agrégé à la Faculté de Medecine de Paris. Paris: Masson et Cie, 1923.

The anterior segment of the globe, especially that part which is presented as the sclerocorneal pole merits separate treatment, as the author reminds us, by reason of its accessibility, the ease with which it can be examined clinically with simple apparatus, and the frequency of its involvement in ocular, as well as in systemic disease. The study of conditions in these tissues in health and under pathological conditions, their normal and morbid histology, anatomy and physiology, must be of value and of more than pasing interest to the oculist as well as to the general practitioner. Terrien has given us such a study in an unusually complete form and interesting manner. The clinical examination in particular, with the use of the ophthalmoscope, the corneal microscope and the slit lamp of Gullstrand, is of great value to the ophthalmologist. The chapters on the physiology of the anterior segment in its relation to intraocular tension are important. The volume also contains a summary of injuries of the anterior segment, wounds and contusions, rupture of the globe, intraocular foreign bodies and their detection by the magnet and radiography. All this, together with the economics of blindness and the causation of sympathetic ophthalmia, the author attempts to present in a few short chapters. Needless to say, not quite successfully.

TONSILS

The Tonsils, Faucial, Lingual, and Pharyngeal. By Harry A. Barnes, M.D. Second Edition. Illustrated. St. Louis: C. V. Mosby Co., 1923.

This study of the lymphoid ring of Waldeyer in its normal and pathological aspects, deals not only with histology and physiology, clinical examination and symptomatology, embryology and developmental history, but with the general pathology and bacteriology of the tonsils and their relation to systemic infections. There is an excellent chapter on tonsil operations, and one on the complications and sequelæ of these procedures. The second edition of Barnes's valuable work presents the latest developments in surgery of the tonsil, such as the capsule splitting operations, and radiation. The chapter on focal infections appears to have been entirely rewritten.

THE UNCONSCIOUS

L'Inconscient. Par. Dr. A. Hesnard. Paris: Libraire Octave Doin, Gaston Doin, Editeur. 1923.

The author's brief but comprehensive survey of the unconscious rouses afresh the wonder that the latter has been so long without its acknowledged place in psychology. Hesnard's point of view is that of a dispassionate psychological inquiry into the place of the unconscious in ontogenetic and phylogenetic development of the mental life, its interrelation with consciousness, both considered as only parts of the same mental life, its indispensable position as the background for interpretation of otherwise mysterious occurrences. These the writer reviews to find that their explanation lies most naturally in the dynamic functioning of that part of the mental life out of sight of consciousness which latter receives only the end product. Psychopathic disturbances are among these occurrences which reveal such activity and which also testify to the affective rather than the rational nature of the unconscious. Various medical theories in relation to the problems of the unconscious are discussed, not the least space being given to Freud's revelations. The author's work is descriptive rather than presenting an estimate of these various modes of approach, yet he both acknowledges the indebtedness of psychology to Freud and to some extent expresses disagreement with him. His very full bibliography, however, adds testimony to the large place Freud and his followers occupy in bringing the unconscious into psychological attention.

PSYCHOLOGY FOR THE BEGINNER

An Introduction to Psychology. By Susan S. Brierley, M.A. New York: Dodd, Mead and Company, 1923.

This book shows how clearly psychology may be presented with due respect to the definitions and methods which belong to the older psychology but with ample room for the consideration of the deeper facts of the human mind which have brought forward both a recasting of definitions and the development of new methods. The author's discussion, briefly simple though its stands, shows how the genetic insight into the things of the mind, the facts with which psychology deals, finds a most natural reconciliation between facts and principles which only superficially appear contradictory. The writer evidently knows her psychology in its more classical aspect and also as a study which includes the unconscious. Her breadth of viewpoint and her clearness of perception form a desirable aim for any would be student or critic of psychology, and they have given here to beginners and others an admirable presentation of psychology which touches its entire scope. It is necessarily brief and elementary. As such it fulfills the author's purpose. But as a direct and unbiased study it clearly points the way to larger knowledge.

HYGIENE OF THE VOICE

Hygiene of the Voice. By Irving Wilson Voorhees, M.S., M.D. New York: The Macmillan Company, 1923.

This little book is one of those written *from* practice rather than *for* practice. It has grown out of the author's experience in examining, advising, and treating singers and speakers. Dr. Voorhees does not assume to discuss the technic of voice production except incidentally to his suggestions for keeping the vocal organs in good condition and avoiding their abuse. His little volume is not only most instructive and of value to the followers of the many vocal professions, and to their would be advisers, but interesting and stimulating as well. It contains much good, commonsense matter presented clearly, tersely, and in admirable style.

OPHTHALMIC YEAR BOOK

The Ophthalmic Year Book. Volume XIX. Containing Bibliographies, Digests and Indexes of the Literature of Ophthalmology for the Year 1922. Edited by Edward Jackson and William H. Crisp. Chicago: Ophthalmic Publishing Company, 1923.

With the year 1923, this publication, which for a time was merged with others to form the *American Journal of Ophthalmology* and later appeared as *Ophthalmic Literature,* now resumes its original form of an annual volume, bringing the references to current literature up to and including December, 1922. With the increasing number of publications in every department of medicine it is becoming more and more difficult to keep abreast of the times in one's reading. A *Year Book* of this sort is a necessity, if only for those who wish to get a complete bibliography on any topic connected with the eye and its diseases, for purposes of reference. But it is much more. The reviews and digests, some of them illustrated, cut down and eliminate a great deal of unnecessary or at least avoidable reading, giving a summing up of all the important publications. *The Ophthalmic Year Book* finally has became a *sine qua non* since the suspended or at best intermittent publication of Michel-Nagel's *Jahresbericht für Ophthalmologie,* the old standby of library workers.

MEDICINE IN WAR AND PEACE

Krieg und Frieden im Lichte der Medizin. Entwurf einer Medizinischen Soziologie. Von Theodore Huzella, Professor an der Universität Debreczen. Berlin: Verlag von S. Karger, 1923.

Of this little *Tendenz-Schrift* one might say "better late than never," if not, *Ex Oriente Lux.* It deals with war and peace and the tendencies of the medical profession, with humanity and its association in the couple, the group or the mass. The social arrangements of human beings in their most manifold expression are seen to have typical but opposite applications in war and in peace, respectively. Huzella's short but exceedingly interesting brochure considers the relation of the physician to this varied activity, the rôle of medicine and of medical men toward masses, cooperating on the one hand, or murderously antagonistic on the other. The whole presentation embodies the reaction and the individuality of a physician to the experiences and impressions of a world at war. Altogether, an unusual and deeply philosophical treatise.

TUBERCULOSIS

Recovery Record for Use in Tuberculosis. By Gerald B. Webb, M.D., and Charles T. Ryder, M.D. New York: Paul B. Hoeber, Inc., 1923.

This is an interesting literary production by two well known phthisiotherapeutists, although the title seems hardly appropriate to the best part of the book; namely, the first eighty pages which contain instructions for the patients to follow. The rest of the book consists of over a hundred pages of blank chart sheets on which the patient is expected to enter his temperature and pulse twice a day, his daily weight, general notes, and the questions he wishes to ask the physician. The reviewer is led to wonder if such daily record taking will not lead to altogether too much introspection. It is a known fact that to make some patients aware of a slight rise of temperature, gives not infrequently a sufficient mental reaction to be the cause of an additional rise.

The first eighty pages of the book are divided into four chapters under the following titles: The Record of Recovery, The Technic of Recovery, Hygiene of Recovery, and Accidents and Obstacles. All the well known instructions usually offered to the tuberculous patients are given in a lucid and interesting way. More than usual emphasis is placed upon the importance of rest.

The authors themselves have perhaps realized the danger mentioned of too much introspection being caused by filling out the daily record sheet, for they have endeavored to put as much optimism as possible in the text and each record sheet is adorned by two quotations collected from authors ranging from those of antiquity up to those of the present time. Graphic sentences from Epictetus, Homer, Sophocles, and Shakespeare, as well as our own Allen K. Krause, Lawrason Brown, and other present day therapeutists, are quoted. Most of these sayings are very appropriate. From Osler is quoted the following: "While there is fever, the patient should rest in bed." From Trudeau: "I know I have hurt nobody by rest; but I am quite sure I often have by allowing them to exercise." Koch's optimistic words are also given: "This is a conflict which we may enter with a surely founded prospect of success." There is one more quotation from Trudeau which because it has so much significance for all tuberculous patients and perhaps also for all physicians treating tuberculosis, the reviewer may be permitted to reproduce here: "The struggle with tuberculosis has brought me experiences and left me recollections which I could not have known otherwise, and which I would not exchange for the wealth of the Indies."

This little volume of Webb and Ryder is a commendable publication for those patients who are resolved to get well and will not take to heart the little variations in temperature and the occasional little losses in weight which are inevitable in the course of this disease. The physician who has such a patient will be glad to be able to recommend this book to him.

Medicoliterary Notes.

The July number of *Health News,* the monthly bulletin of the New York State Department of Health, is a Hermann M. Biggs memorial issue. It contains a sketch of Doctor Biggs's life and work and a series of tributes from many of his friends and colleagues.

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Clothing the Baby is the title of a bulletin recently issued by the Home Economics Department of the University of Wisconsin. Dr. Dorothy R. Mendenhall, the author, makes a plea for simplicity, warmth and lightness of material in dressing babies.

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The National Committee for Mental Hygiene is compiling a directory of all physicians in the country who are practising neurology and psychiatry, with autobiographical information concerning each, so far as possible. . . .This information will be used to meet the demand for the services of such specialists in different communities . . . as well as the increased demand for neuropsychiatrists in institutional positions.—*Mental Hygiene Bulletin.*

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The *Yale Review* for October is a number of unusual interest. Among noteworthy articles are A Playwright's Mind, by Jacinto Benavente; Are Americans Timid People? by Agnes Repplier; New Lights on Egypt, by Sir W. M. Flinders Petrie; and On Contemporary Stupidity, by Hilaire Belloc.

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Dr. C. Armstrong, of the U. S. Public Health Service, has a comprehensive and very interesting article on dengue fever in the *U. S. Public Health Reports* for August 3d.

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The report of a recent meeting of the British Medical Association, at which the much mooted question of "What constitutes health?" was discussed at some length, throws some interesting light on the change in medical opinion that has taken place in the last few decades. At the beginning of the socalled scientific age in medicine, the stethoscope was the instrument upon whose findings judgment was based. Now the index of health is generally conceded to be fitness to carry on daily work without undue physical or mental stress—a far cry from the former socalled medical death sentence type of prognosis.

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A public health educational campaign which is expected to reach several thousand people has been planned by the Illinois Health Department. Every important county fair and all larger fairs are being covered by field units equipped with motor cars, moving pictures, lectures, and other necessaries for conducting demonstrations and exhibits. The programs embrace motion picture shows, poster displays, distribution of literature and superficial physical examinations for adults. A larger number of well baby conferences have also been planned.

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The Illinois Legislature has passed a law making it a punishable offence to maintain or lease houses of ill fame for purposes of prostitution, disorderly conduct, gambling or drinking. The penalty is a fine of not more than $200 or imprisonment for not longer than two years.

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A recent issue of the *National Geographic Magazine* contains an interesting account of a present day Robinson Crusoe, this time including a Mrs. Crusoe, living on Middleton Island off the Alaskan coast, where they have a blue fox farm. Their Friday is an old black horse that had been abandoned to fate by former residents of the island.

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Industrial Hygiene for August has an article by Dr. C. Macfie Campbell on Mental Factors in Industrial Hygiene.

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The proposed exhaust chimney suggested by Prof. Yandell Henderson, of Yale University, as a partial solution of the automobile carbon monoxide problem in large cities, is being widely commented upon, both pro and con, in many of the medical and scientific journals.

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A full and detailed study of some new aspects of tumors forms the leading contribution to the number for June 5th of the *Belgian Annales et Bulletin de la Société Royale des Sciences Médicales et Naturelles de Bruxelles.* Doctor Reding is the author. A bibliography of recent articles on the pathology of tumors is appended.

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The New York City Department of Public Welfare has established as a part of its work a cancer institute, the clinic division of which is situated at 124 East Fifty-ninth Street, and the hospital division on Welfare Island. As the institute is established especially for the benefit of the poor of the city, no charges are made for its work, which includes the complete diagnosis, and the surgical, radium, and high voltage therapy of cancer.

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In a recent number of the *Nature Magazine,* Dr. William T. Hornaday, curator of the New York Zoological Garden, makes a strong plea for protection of the wild life of the country from hunters in automobiles. He declares that their ravages are not sport, but slaughter, and estimates that "the automobile has increased the perils of wild life by fifty per cent." He describes as an example of what has been done in other countries—a warning to America—the slaughter in the first few days of an open season of practically all the long protected and unsuspecting chamois in the Swiss Alps, setting back the species to the original vanishing point. Much hunting of herds of animals and flocks of birds is now done with machine guns carried by automobiles, and as a result many valuable species are threatened with immediate extinction.

Practical Therapeutics

THE MANAGEMENT OF THE COMMON FORMS OF RECTAL DISEASES COMPLICATING PREGNANCY

By Arthur A. Landsman, M. D.,
New York,
Attending Proctologist to the Jewish Memorial Hospital; Deputy Surgeon, Diseases of the Rectum, Out Patient Department, New York Hospital, etc.

In the pregnant woman there is a decided tendency toward the development of rectal disturbances because of the natural changes produced by gestation. The various types of hemorrhoids are the most common, but fissure, abscess about the rectum, fistula, polypi which have become strangulated, and fecal impaction are not infrequently met, and many women date the beginning of what they describe as piles to pregnancy and childbirth. The causes which predispose them to these ailments are to be found mostly in the interference with the local circulation from the enlarged uterus, the congestion of the parts incidental to pregnancy, and the chronic constipation from which so many women suffer at this time—all doubtless accentuated later by difficult labor and aggravated by prolonged involution.

Because of the possible effects of rectal diseases upon the course of pregnancy, as well as upon the general health of the mother, the proper management of these conditions becomes a matter of no small importance. It is well within the bounds of possibility for gestation to be interrupted by an acutely painful fissure or abscess, by extensive thrombosis of the anal veins, or by strangulation of large masses of internal hemorrhoids, while the persistent bleeding which complicates some cases of ulcerated piles can not fail to have a bad effect upon the health of the expectant mother. In view of these dangers, what is to be done for these patients to prevent rectal disorders, and how to treat them should their prevention be impossible, becomes a vital problem.

Although even serious operations have been performed upon pregnant women without interrupting gestation, it is well to keep clear of surgery at this time except in cases of emergency, in which it may be considered as the lesser of two evils. But if operate we must, only the minimum which will afford relief is permissible, all extensive surgery being postponed for a more favorable period.

Much may be done to prevent rectal disturbances in gravid patients, not only by carrying out general hygienic measures, but in the avoidance of certain conditions which prepare a favorable soil for their development. Foremost among these is constipation, by which we understand not only delayed evacuations, but stools which require much straining for their expulsion. Mankind has always found it easier to solve the problem of constipation by taking so much out of a bottle three times a day, than by a systematic effort to regulate the function of the body; but the habitual use of physics is an unmitigated evil which in time defeats the very purpose it is intended to serve. Regulation of the gastro-intestinal function can not be brought about by the use of drugs, but is largely a matter of rational living in which a suitable diet plays no small part. Its essentials are plain, simple, wholesome fare, a generous allowance of fresh fruits and vegetables, plenty of water, fermented milk, buttermilk, etc., and the avoidance of rich foods and stimulants. Rest in the knee chest position two or three times daily to ease up pressure and help the return circulation is a useful measure in those predisposed to hemorrhoids. If an acute attack of hemorrhoidal trouble does occur, the patient is to be put to bed, an oil and water enema given, and the edema treated with cold applications of a solution of lead subacetate, witch hazel or dilute aluminium acetate, with one or two doses of morphine if necessary to relieve pain, lessen nervous tension, and secure sleep. Even marked swellings may often be thus reduced and the patients tided over the acute stage of their troubles.

Prolapsed internal hemorrhoids should be replaced by gentle pressure, and retained by rest, posture and the application of a firm T binder. But if the hemorrhoids have become strangulated reduction is of no avail, and resort must be had to surgery, preferably under local anesthesia, without dilating the anal sphincters. If the symptoms persist and the parts become tender and throbbing, localized infection is to be looked for, and if found, treated by early incision to prevent perirectal burrowing. But here again we are to be guided by conservative principles and limit operative intervention to what is needed to give immediate relief—incision and drainage of the pus cavity. If the abscess ruptures into the bowel or on the skin surface, the openings may be enlarged, but on no account is the fistulous tract to be excised until after delivery.

One of the most annoying rectal affections with which we have to deal is fissure in ano, which, because of the acute pain, the reflex pelvic disturbances which it may cause, and its tendency to become complicated with abscess and fistula, is of especial interest in this connection. If it is of recent origin and not deep, we may be able to lessen its symptoms and even secure permanent relief by a regulation of the diet and local applications of stimulating and antiseptic substances. The diet best suited is one which will aid in forming stools containing a large percentage of moisture. Stools which are watery carry small fecal particles into the bottom of the fissure, and are difficult to dislodge because of the spasm of the muscles generally present. On the other hand, evacuations which are excessively dry traumatize the parts and prevent healing. We advise vegetables and fruits in abundance, and the addition of olive oil, buttermilk, fermented milk, sour cream and plenty of water. Locally, argyrol, nitrate of silver and ichthyol are used in various strengths, but if the symptoms remain unrelieved there is no choice but surgery. A clean cut incision under local anesthesia through the bottom of the fissure, gauze drainage, and rest in bed for a few days will generally give relief. It might be mentioned in this connection that fissure is occasionally found associated with solitary pedunculated polyp of the rectum; if the growth becomes strangulated it is prone to set up much pain and considerable disturbance of neighboring structures by reflex irritation. Naturally, unless the cause of the trouble is discovered, treatment of the fissure alone will be unavailing.

Fecal impaction is likely to occur in those patients who have a tendency to hard stools and chronic constipation, and is aggravated at this time by mechanical obstruction due to the enlarged uterus. Small particles of stool may be passed and these patients often insist that they are not constipated, but digital and proctoscopic examination will reveal the true state of affairs. It is advisable to put them upon a proteid diet, and make an effort to clean out the rectum with enemata of warm water and oil, oxgall, glycerine, peroxide of hydrogen, etc., but if unsuccessful the mass will have to be removed under general anesthesia.

Ulceration of the rectum must be treated with due consideration of the underlying cause, which applies principally to the amebic, luetic, and tuberculous types. Since it is frequently complicated by severe and persistent bleeding, the treatment of the local condition is of primary importance; irrigations and instillations of such substances as silver, quinine sulphate, coal oil, mixtures of bismuth, iodoform and petroleum oil have been used with much benefit.

To summarize the management of rectal diseases occurring during pregnancy, the following may be restated:

1. Suitable care of the intestinal tract as a prophylactic measure.
2. Medical treatment of conditions as they arise.
3. Surgery, if necessary, the keynote of which should be conservatism.

310 West Eighty-sixth Street.

URETEROVAGINAL FISTULA FOLLOWING HYSTERECTOMY

With Unusual Recovery

By Henry A. Bernstein, M. D.,
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Medical literature is not wanting in instances of spontaneous repair of ureteral injuries due to surgical accidents, but a careful search does not disclose any description of an exactly similar circumstance of recovery as the following:

The patient, Mrs. L., came to the operating table in March, 1920, after a severe uterine hemorrhage. She gave a history of almost constant bleeding for three weeks, with a blood picture of 50 per cent. hemoglobin, 3,000,000 red cells, 1,200 leucocytes, and 70 per cent. neutrophiles. She was thirty years of age and had one child, eight years old. There had been no miscarriages and no other pregnancy. An only sister underwent a hysterectomy for fibroid uterus at the age of twenty-eight. On account of the patient's anemic condition a transfusion was considered necessary and she received 800 c. c. whole blood just before the operation, under the direction of Dr. L. J. Unger.

I shall not dilate upon the operation, which consisted of the removal of the upper part of the uterus (the fibroid extended to about an inch and a half above the umbilicus), except to say that all normal anatomical landmarks were distorted and adhesions everywhere made a mess of calculations. During the separation of adhesions a clamp was accidently placed on the left ureter. This was immediately discovered and removed without any apparent evidence of injury. The patient had a stormy convalescence and recovered slowly and with much suffering. A blood count taken two days after the operation showed hemoglobin 70 per cent., red cells 3,500,000, white cells 1,200, neutrophiles 70 per cent.

Five days after the operation the patient complained of feeling wet and very soon urine began to flow from the vagina, forming a lake in the bed and requiring constant attention to keep her comfortable. She was discharged from the hospital three weeks after the operation in a very miserable condition, and continued this way all summer, leaving evidence of her presence wherever she sat or stood. The urine continually showed a large quantity of pus and her body temperature ranged between 99° and 102°. Off and on she suffeed from cramps and burning sensations in the lower back and pelvis, probably due to escape of urine into the pelvic cavity and tissues surrounding the bladder.

On September 16th I examined the bladder by cystoscope but found nothing out of the ordinary, except that the left ureteral orifice appeared puffy and without evidence of any urinary discharge. More from timidity than from any other reason I did not at this time attempt to catheterize the ureter. A blood count was taken September 18th, showing hemoglobin 55 per cent., red cells 3,200,000, and white cells 1,200, with neutrophiles 68 per cent. Urine practically poured out of the vagina and continued to show a large pus content. The patient demanded relief and theatened to terminate her existence.

A second operation was under consideration either for repair of the ureter or the removal of her left kidney, but the operative risk, on account of her poor physical condition, prevented a rash decision. A second transfusion was decided upon preliminary to surgical intervention, and she again received 800 c. c. whole blood, the result of which was a decided improvement in her physical condition, but the leakage of urine still continued.

On October 19th I again examined the bladder with the cystoscope and decided, though with some hesitation, to test the patency of the left ureter by catheterization. A catheter was inserted without difficulty, and in a short time I was pleased to observe a few drops of urine flow from the outlet. I did not at that time attach too much importance to this circumstance, but was delighted when the patient, about a week later, notified me that she was voiding urine in a normal fashion and had not had any leakage since the last visit to my office. She has continued to improve in health and up to the present time has gained forty pounds in weight, and has evidently recovered all the normal functions of her ureters and bladder.

Beyond doubt there was a tear in the ureter near the bladder due to the accidental application of the clamp. This tear, forming a vlave, prevented the urine from that side entering the bladder and allowing its escape into the surrounding tissue where it finally found an exit through the operative wound into the vagina. By insertion of the catheter the valvelike portion was shoved into place and granulation, assisted by the new blood administered in transfusion, caused the wound in the ureter to be closed permanently and the patient was carried on to recovery.

It may not at all times be wise to insert a catheter into an injured ureter, especially if there has been a complete separation of this tube. The danger of carrying infection up from the bladder must be considered. The other end is not always found and the catheter may penetrate the peritoneum with serious consequences. Yet in incomplete tears there are many cases where this simple procedure will reestablish the lumen of the organ, and restore the patient to health.

115 West Seventy-third Street.

TUBAL ABORTION

By Harry Cohen, M. D.,
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The subject of ectopic gestation has always been and, I suppose, will always continue to be of considerable interest. The ease with which the diagnosis is made in most cases, the pathognomonic signs and symptoms, the spectacular operation, especially in cases of rupture, and the low mortality, all appeal to the surgeon. To the patient and her family, an ectopic gestation confirmed by operation is a definite and comprehensible pathological entity, with its apparent dangers to life recognized. In this paper the etiology, symptomatology, history, etc., will be mentioned only briefly since these have already been described thoroughly by innumerable writers. Only such facts will be emphasized as I feel are important.

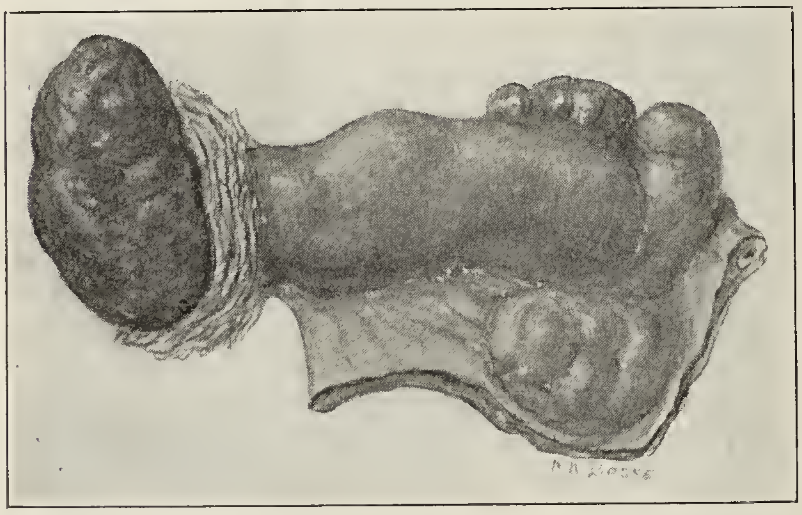

Fig. 1.—Tube whole with blood clot protruding from fimbrial end. (Case I.)

In the first place, I shall enumerate briefly the most important diagnostic signs. I can offer no improvement on those cited by Ladin (1) which are for the unruptured ectopic gestations:

1. Amenorrhea.
2. Subjective symptoms.
3. Pain caused by eroding cells in tubal pregnancy or to distention of the tube caused by the constantly growing ovum.
4. Uterine hemorrhage which is the result of decidual degeneration and separation.
5. Uterus somewhat enlarged.
6. Distended tube.
7. Two negative signs. a. No elevation of temperature. b. Exclusion of uterine pregnancy.

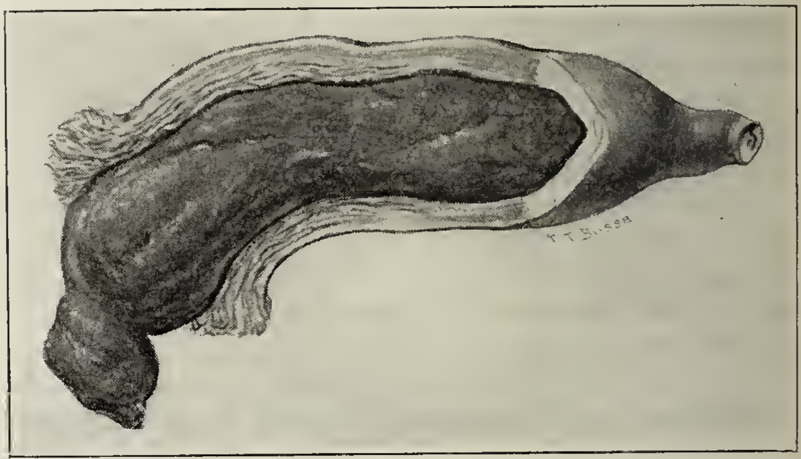

Fig. 2.—Tube with one side removed to show extent of clot which protrudes through fimbrial end. (Case II.)

In ruptured ectopic pregnancy, in addition to the signs mentioned above, there are also signs of hemorrhage, depending on the amount of bleeding, from slight syncope to shock and collapse. There is little that I can add to the etiology of ectopic pregnancy. Anything that will cause an incomplete obstruction in either tube can be the cause—salpingitis, adhesions, occasionally malpositions of the uterus, etc. In a case reported by Streeter (2) a subcutaneous implantation of the ovum was found which was caused apparently by a former modified Gilliam operation. This subcutaneous implantation of the ovum was an unusual form of tubal abortion. Gonorrhea has been blamed for many cases. Extrauterine pregnancy is not infrequently found in single girls.

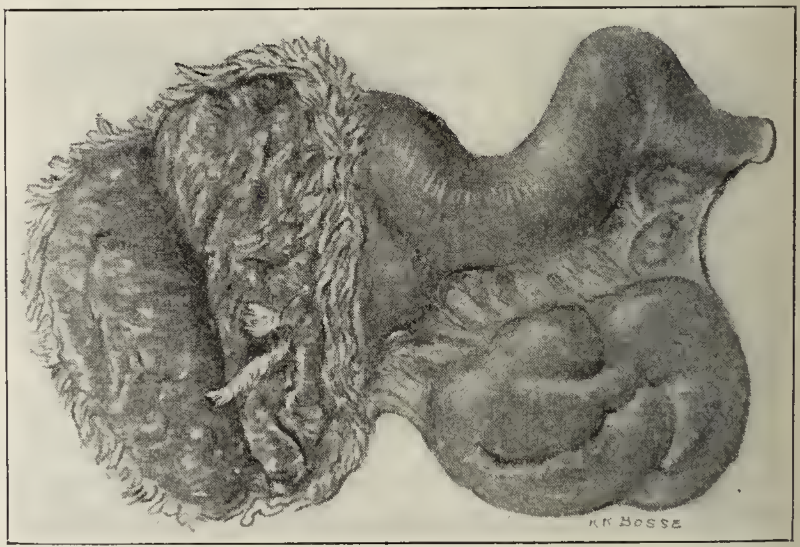

Fig. 3.—Tube with extruded mass walled off and adherent to fimbrial end. (Case III.)

The pathology, especially the gross pathology, presents an easy means of diagnosis. Caturani (3) found that of one hundred cases removed with the clinical diagnosis of tubal pregnancy only fifteen did not show positive microscopic evidence. On the other hand, the complete tubal abortion and hematosalpinx presented serious difficulty to the finding of evidence. His conclusions are that hematoceles are the result of ectopic gestation. It is a well known fact that most ectopics when they rupture do nothing more than abort through the fimbrial end of the tube. This happens in the majority of the cases. In only a small number do the tubes actually rupture. This tubal abortion may be so complete that, as cited by Caturani, no evidence of pregnancy may remain in the tube. Taylor (4) states that in a few cases of tubal abortion no operation was necessary. This is the explanation of the abdominal pregnancies of which many are on record. This brings us to the object of this paper which is to show by means of three specimens various stages of tubal abortion.

CASE I.—C. A., aged twenty years, married eight months, was admitted to the People's Hospital, November 1, 1919, with a history of one month's amenorrhea and two weeks' bleeding. Six hours before operation signs of tubal abortion developed with hemorrhage. At operation the abdomen was found to be filled with blood and the right tube presented the appearance of tubal abortion. The tube was only slightly enlarged. The patient gave birth to a normal child one year later.

CASE II.—A. B., aged twenty-eight, referred by Dr. J. Ruchman, was admitted to the People's Hospital on September 2, 1921, with signs and symptoms of a right sided ruptured ectopic pregnancy of approximately six weeks' duration. The patient had had two previous normal deliveries. On operation, the abdomen was found filled with blood and the right tube presented the appearance of a tubal abortion. The tube was considerably enlarged, and a clot was extruding through the tubal end. The clot, however, occupied the entire cavity of the tube, as was noticeable when the tube was cut open and part of the wall excised. In this case the ovary was not removed and therefore only the tube was seen.

CASE III.—M. M., aged twenty-six, referred by Dr. J. Philips, was admitted to the People's Hospital on March 25, 1919, with a history of two months' amenorrhea with subsequent signs and symptoms of a left ruptured ectopic gestation. At operation the tube was found considerably distended and the ovum had been expelled through the fimbrial end and was walled off and adherent to the tube.

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221 SECOND AVENUE.

Treatment of Gynecological Conditions by X Rays and Radium.—Robert Knox (*British Medical Journal,* October 14, 1922) shows that in serious cases it is always well to control the treatment by x rays and radium with blood counts at regular intervals so as to avoid accidents. A drop in the total number of white cells is always an indication that treatment must be suspended or continued cautiously; it is also a guide for the actual dose. In fibromyoma, for example, the contraindications for x ray treatment are: 1, calcareous degeneration of a large portion of the fibroid or if the tumor is large; 2, most forms of degenerations, but treatment may be tried if the degenerations are not extensive; 3, malignant disease of the uterus requires careful consideration; if the tumor cannot be removed, a combined attack with x rays and radium is indicated, and radium tubes should be applied carefully under general anesthesia; 4, complicating infective conditions of the uterus; 5, suppurative salpingitis or pelvic peritonitis; 6, inflammatory conditions of other organs in the vicinity, such as appendicitis, cystitis, etc., should be treated before treating a fibroid; 7, submucous pedunculated fibroids.

The advantages of x ray treatment are: 1, painlessness and ill effects of a temporary nature; 2, it does not interfere with the patient's ordinary habits of life; 3, no elaborate preparations are necessary; 4, the resulting menopause shows no such severe nervous disturbances as does operation; 5, recovery is rapid when the hemorrhage has been arrested and the shock from hysterectomy is avoided. The disadvantages are: 1, the long time necessary to obtain a result; 2, the treatment is not invariably successful; 3, the tumor does not disappear entirely; and 4, treatment may cause unfavorable changes in the blood. Indiscriminate treatment is dangerous, resulting in serious skin burns. The blood may be prejudicially affected by the larger doses in use at the present time. Overdoses to the deeper structures may give rise to serious disturbances of function at a later date.

Test of Labor.—W. G. Lee (*Surgery, Gynecology and Obstetrics,* July, 1922) from a study of one hundred consecutive deliveries concludes that no patient should be submitted to the test of labor in whom there are either obvious obstacles to pelvic delivery or emergency conditions necessitating speedy emptying of the uterus. The test of labor, therefore, primarily concerns cases in which spontaneous birth is hoped for, in the present and subsequent pregnancies. Operative delivery, when spontaneous birth does not ensue, should be by the pelvic route. Primiparity, posterior positions, dry labors, oligohydramnios, and constriction rings of the uterus, increase the percentage requiring operative delivery, particularly when they occur in combination. Constriction rings occur practically only where oligohydramnios or dry labor are present. Lack of progress for a considerable time is the predominant indication for interference. Occurring alone the determination of the moment for such interference demands careful consideration and wise judgment. Beginning maternal or fetal exhaustion, or threatened rupture of the uterus, developing with lack of progress, present indications for immediate interference. Any lack of progress, however, demands prompt, careful analysis to determine its probable cause with particular watchfulness for the development of such subsequent urgent indications for interference. Following a given test of labor, subsequent pregnancies should have an improved prognosis. Forceps will always be the most used method of terminating nonspontaneous labors; therefore, the technic of forceps operation is of paramount importance, and should receive greatly increased attention in obstetrical teaching.

Proceedings of Societies

AMERICAN ASSOCIATION OF OBSTETRICIANS, GYNECOLOGISTS AND ABDOMINAL SURGEONS

Thirty-fifth Annual Meeting, Held in Albany, N. Y., September 19, 20 *and* 21, 1922.

The President, Dr. Roland E. Skeel, of Los Angeles, Cal., in the Chair.

Tumors of the Breast.—Dr. John F. Erdmann, of New York, emphasized the belief that a growth in the remaining breast was as likely to be of primary origin as that in the breast first removed. Further, at the present day we were unable to state what the influence of x ray and radium was either as a preoperative or postoperative aid. But in view of many apparent reductions in size, etc., previous to operation in cases considered nonoperable, the use of x ray and radium should be encouraged. Even in view of some of the glowing reports at present regarding nonrecurrence, postoperative treatment should be substituted for preoperative, until some definite proof of its help or inefficiency had been established —since too few years had passed in his opinion for positive results to be shown. In the presence of late metastases the powerful currents of the present day should be given a thorough test to prove or disprove the efficiency of this method of treatment. The most thorough and painstaking wide removal, with remote glandular and fascial dissections would tend more and more to increase the percentage of cures and extension of life. The radical operation is attended with so low a mortality as to promote a greater desire on the part of the consulting physician to demand operation.

Genital Abnormality.—Dr. H. Wellington Yates, of Detroit, Mich., said that he had observed one case of abortion at about the sixth week in which there were a complete vaginal septum and a double uterus, except that the latter also had a septum between two otherwise normal uterine cavities. Complete vaginal absence was seldom found in any but nonviable monstrosities according to Anspach, but the case reported rather refuted this statement. Marked vaginal atresia might be the result of a vaginitis of gonorrheal origin, but complete congenital atresia was associated with anomalies in the development of the Müllerian duct and under those circumstances was always associated with abnormalities of the uterus and adnexa of one side. A true atresia of the vagina must be differentiated from the inflammatory type which was but the result of some acute infective agent.

Craniotomy.—Dr. A. M. Mendenhall, of Indianapolis, Ind., stated that craniotomy was an operation we should have no hesitancy in deciding upon in all cases where the child was dead and there were no insuperable obstacles to pelvic delivery of the mutilated child. Craniotomy upon a living child might at times be indicated if there existed little or no hope of its ultimate survival and the mother would be seriously jeopardized by any other method of delivery. The operation *per se* should carry with it no maternal mortality. With the safety of Cæsarean section in its various forms developed to where it was today, a craniotomy performed upon a living child always presented improper care either by the operator or his predecessors on the case.

Radium in the Treatment of Uterine Hemorrhage of Nonmalignant Type.—Dr. Edward A. Weiss, of Pittsburgh, Pa., said that in the treatment of benign hemorrhage from the uterus the following observations were to be considered: radium should be used only in selected cases such as myopathic bleeding of adolescence that did not respond to usual medical and hygienic measures; myomata with bleeding as a symptom that was of small or moderate size and uncomplicated by adnexal disease; menorrhagia of the menopause. The dose depends upon the age of the patient and upon whether the function of childbearing was to be preserved or sacrificed. Myomectomy in young women and hysterectomy when the tumor was large or complicated should be done rather than treatment with radium. Complications and unfavorable results are to be avoided only by a careful discriminating differential diagnosis. All cases treated by radium should be carefully followed up for several years.

The Cervix as a Focal Point of Infection With a Unique Case in Illustration.—Dr. Gordon K. Dickinson, of Jersey City, N. J., said that the cervix was a definite organ with a distinctive function. As a portal to the endometrium it allowed passage of nature's fluids. It also picked up bacteria, and carried them into the recesses of the mucosa, where they were either destroyed or became saprophytes. Harbored microbes might inflame the cervix and through the lymph stream cause more or less regional reaction, or, by the blood stream a varied expression. The cervix might act as a focal point for infections.

Uterine Displacements and Sterility.—Dr. Benjamin Rush McClellan, of Xenia, Ohio, stated that uterine malpositions were the cause of sterility in a limited number of cases, probably not over ten per cent, which, though small, was quite too large to be negligible. Long continued sterility or repeated abortions should make the gynecolgist suspect a displacement of the uterus. Malpositions acted as a cause of sterility by mechanically interfering with the progress of the spermatozoa into the uterine cavity and by contributing to the functional disability of the tubes and ovaries which, when long continued, resulted in organic degeneration, especially in the ovaries. In a few well selected cases a well placed pessary plus wisely directed hygienic and therapeutic remedies should be given a fair trial. Operative intervention was indicated in all cases where the foregoing treatment had failed, and where there was no legitimate contraindication.

Present Status of Surgery in Treatment of Fibromyomata Uteri.—Dr. Stephen E. Tracy, of Philadelphia, Pa., said that the status of any method was determined by the end results. To determine the best form of treatment for these neoplasms it was necessary to consider the degenerations in the tumors, the malignancies in the pelvic organs and the associate abdominopelvic pathology. Of all of the patients who consult a surgeon for symptom producing fibroids, thirty per cent had either degeneration of the tumor or malignancy of the pelvic organs. Abdominopelvic disease was found in forty per cent of the cases; seventy per cent of these patients had complicated tumors. In women past age of forty only sixteen to eighteen per cent. had simple uncomplicated tumors. It was impossible by any method of examination to determine which were simple uncomplicated tumors. The treatment of choice in the vast majority of cases was myomectomy for women under the age of forty years and hysterectomy in women past this age. This form of treatment removed all diseased tissue and relieved the patient of all symptoms in ninety-six to ninety-eight per cent of cases. Radium had a definite, though limited, field of usefulness in the treatment of these neoplasms. The use of radium should be restricted to small or medium size uncomplicated tumors at the menopausal period, to a patient with menorrhagia or metrorrhagia following myomectomy, and in certain constitutional diseases in which surgery would be attended with unusual risk.

Clinical Aspects of Blood Loss in Labor.—Dr. Paul T. Harper, of Albany, N. Y., stated that the intrauterine tamponade could be counted upon to check any postpartum hemorrhage, and such preparations should be made that it could be carried out without delay as soon as the more conventional methods demonstrated their inadequacy. Not only was it the most efficient method of active treatment of hemorrhage, but it was prophylactic as well, in that it made subsequent blood loss negligible. It expedited the convalescence from antepartum and intrapartum hemorrhage by making even physiological postpartum loss impossible.

Pituitrin in the Second Stage of Labor.—Dr. Magnus A. Tate, of Cincinnati, Ohio, said that from the literature at his command, where pituitrin was used in the second stage of labor, he found cases reported where the child was said to be asphyxiated, others where there was undue compression of the body of the child, cases of cerebral hemorrhage, separation of placenta, extensive lacerations of the cervix and rupture of the uterus. In some cases infants born alive became paralyzed and others became idiots and epileptics. He also found it stated that uterine tetany might occur following very small doses. He had used pituitrin in the second stage of labor for a number of years, and during the past year in thirty selected private cases, and had come to the conclusion that, if used judiciously, it was a boon to motherhood.

Malformations of the Uterus and Appendages.—Dr. Arthur T. Jones, of Providence, R. I., said that there were many varieties of malformations, most common of which were, 1, the uterus unicornis in which only one duct of Müller was developed. 2, the uterus bicornis in its various forms, in which both ducts were equally developed but there was fault in normal fusion and absorption. 3, uterus bicornis in which one duct was imperfectly developed and had no connection with the vagina. 4, the uterus didelphys in which the halves were separate throughout. 5, the uterus septus in which externally the uterus felt normal, but the partition between the middle portion of ducts of Müller had never absorbed. 6, uterus bipartus, in which both uterus and vagina were double and lay side by side as separate tubes. 7, double vagina in which fusion, absorption and development of the ducts of Müller were normal until the vagina was reached and here a partition was left, dividing the vagina throughout more or less of its length. In any of the above mentioned, pregnancy might take place. The conclusion he drew was a plea for conservatism and operations of a plastic nature to be resorted to rather than a complete removal of the female organs of regeneration. Uterine malformations should be watched for.

Transplantation of the Cervix.—Dr. W. Wayne Babcock, of Philadelphia, Pa., said that this operation was used in certain cases of sterility, anteflexion of the cervix, anteposition of the lower uterus segment, and for undue shortness of the anterior vaginal wall. In some cases the sutures were made to embrace the uterosacral ligaments so as better to hold the cervix up and back. In the first operation of this type which he performed about fifteen years ago for sterility of eleven years' duration, pregnancy quickly followed. The operation was simple, quickly performed and seemed to be of value.

Pernicious Effects of the Use of Stems in the Uterus.—Dr. J. N. West, of New York, states that in doing dilatation and curettage one should always wipe out the cervix with tincture of iodine so as not to carry the organisms which were found in the cervical canal into the body of the uterus and vaccinate them there with the curette. This applied to any other intrauterine instrumentation, except the use of forceps in delivery. He would advise against leaving the uterine packing more than thirty-six hours and then the use of iodoform gauze from which the iodoform had been washed by wringing out in water three or four times. Finally, the ideal surgical relief for dysmenorrhea, which was practically uniformly successful, was a thorough dilatation of the cervix and Emmet's amputation to a point one third of an inch below the internal os. This procedure had resulted uniformly in the relief of dysmenorrhea of anteflexion, and in many cases had relieved sterility.

What Is the Procedure in Cases of Dry Labor With Undilated Soft Parts, With a Study of the Relative Value of the Several Types of Section.—Dr. John Osborn Polak, of Brooklyn, stated that all cases of dry labor would fall within one of three classes. It must be admitted that each case of dry labor should be considered on its individual merits. The determining factors in selection of method were the position of the presenting part, the length of the labor and the condition of the cervix. Where infravaginal delivery was possible cervical dilatation was best handled with morphine and vaginal plugging, and finally, when section was elected, owing to the fact that all dry labors were potentially infected, the classical operation was not the one of choice, but one should be selected that excluded the peritoneal infection by peritoneal flaps.

(To be concluded.)

Abstracts from Current Literature

GYNECOLOGY AND OBSTETRICS.

Symptomatology of Displacements of the Uterus and Their Operative Treatment.—E. Schwarzenbach (*Schweizerische medizinische Wochenschrift,* October 12, 1922) asserts that the cause of the subjective symptoms in displacements of the uterus is always in the ligaments and that the circulation in the ligaments is often impaired in the operative correction of the displacement. The virginal displacements, as a rule, should not be treated; only when they have reached a severe degree after the onset of puberty, which is indicated by mechanical injuries corroborated by rectal findings, may subjective symptoms require treatment which should be operative, namely, fascial ventrofixation and not the Alexander-Adams operation. The retrodisplacements occurring in the puerperium should be corrected as soon as possible by treatment with a pessary for one half to three quarters of a year. Therefore. every woman should be examined to ascertain the position of her uterus about six weeks postpartum. If the retrodisplacement recurs, operation is indicated even before the symptoms develop; frequently the Alexander-Adams operation still suffices. If the patient decides in favor of an operation much later because of the severity of the symptoms, a fascial ventrofixation becomes necessary. Nonvirginal retrodisplacements, and those discovered after the puerperium, in which the time of origin is unknown and which produce no disturbance, should not be treated, regardless of whether they are fixed or not, except to cure sterility.

The operative treatment recommended is the following: The broad ligament should be spread out wide and lifted up, thereby bringing the uterus up into place and promoting the circulation in the ligaments. The uterus is held in place with a pedunculated strip of fascia from the anterior aponeurosis of the rectus muscle. It is sutured with silk to the anterior wall of uterus and the whole is covered over with the peritoneum. With this procedure, the root of the fascial flap is high enough so that the uterus can expand during a subsequent pregnancy without interference.

Atypical Epithelial Proliferations on the Uterine Cervix.—Fr. Chr. Geller (*Zentralblatt für Gynäkologie,* March 10, 1923) states that epithelial proliferations occasionally occur at the external uterine os, especially at the border between the pavement and cylindrical epithelium, which are difficult to characterize histologically, because even the most careful microscopic study fails to disclose their clinical dignity. The examination of three such cases revealed pavement epithelium at the suspected site and among it cervical tissue, which, however, showed changes in the cervical mucous membrane in so far as stratified or pavement epithelium was found under the specific epithelium and carcinomalike plugs proliferated into the depth, especially from the pavement epithelium. This pavement epithelium may originate from indifferent cells which remained from the fetal period between the cells of the cervix and which carried the ability to form pavement cells in themselves. These are epithelial proliferations, which originate from indifferent cells after a long period of latency, probably as a result of a disturbance of the normal relationship of the tissues to one another. They have been called cells with a disturbed internal balance. It is uncertain whether and when such proliferations come to a standstill. These cases should be repeatedly examined microscopically or at least be kept under continuous clinical observation.

Promontory Fixation in Prolapse of the Uterus.—Hans Hermann Schmid (*Zentralblatt für Gynäkologie,* March 10, 1923) lays stress upon the fact that the indications for promontory fixation of the uterus to a fixed bony point, for prolapse is far superior to the other operations for holding the uterus in its proper position, but that it can be used harmlessly only when the posterior lip of the cervix can be approximated to the promontory without tension. However, even under favorable conditions, there is always the danger of intestinal obstruction if the attached cervix becomes separated and a buckle forms between it and the promontory. This operation is indicated only in prolapse with a deep *cul de sac* of Douglas, when, for other reasons, a laparotomy must be done, in recurrent prolapse, and in prolapse of the vagina following extirpation of the uterus or supravaginal amputation.

Treatment of Eclampsia.—Thomas Watts Eden (*British Medical Journal,* October 14, 1922) bases his treatment of eclamsia on five points: 1. As it is easier to prevent eclampsia than to cure it, prophylaxis is all important. The premonitory symptoms of eclampsia should always be looked for. Prophylaxis requires rest in bed, fluid diet only (mostly water), saline purgatives, and diuretics. The salient points to watch are the amount of urine and albumin, the edema and the blood pressure. If progress is unsatisfactory, or if relapses occur after temporary improvement, labor should be induced immediately. All women who have at one time been on the verge of eclampsia should have labor induced, although it is well to wait until the symptoms have disappeared under treatment, if possible. 2. After a fit has occurred, prompt removal of the patient to the hospital is the first indication. The patient then requires a darkened quiet room, continuous supervision by at least two trained nurses, careful attention to the condition of the respiratory passages, plenty of fresh air with oxygen in reserve, and the continuous assistance of a clinical laboratory and expert medical superintendence. 3. A simple classification of cases as mild or severe according to, a, the amount of albumin in the urine (catheter), b, the number and frequency of the fits and c, the mental condition of the patient would greatly facilitate treatment. The severe cases are those with solidification of the urine on boiling, more than ten fits, and a continuous condition of coma. The mild cases are those with a moderate amount of albumin, few and infrequent fits, and a clear mind between the fits. 4. All cases of eclampsia are best treated by the minimum amount of obstetrical interference, limited to the induction of labor if it is not spontaneous and termination of the second stage of labor by low forceps when the head is on the perineum. Patients delivered either naturally, or by induction of labor, or by low forceps, show a much lower mortality than those delivered by rapid methods, such as accouchement forcé or Cæsarean section. The expectant obstetrical methods show the best results. Delivery by rapid dilatation of the cervix is unjustifiable and best avoided. Cases delivered by Cæsarean section show a mortality nearly double that of the similar cases delivered naturally or by simple obstetrical measures. 5. Simple medical treatment carefully regulated and constantly watched gives the best results. The methods of Stroganoff and Hastings Tweedy are simple in conception and detail. The general adoption of the principles advocated by these authors would result in an immediate reduction of mortality.

Calcium and Phosphorus Metabolism of Premature Infants.—B. Hamilton (*Acta Pœdiatrica,* July, 1922) concludes that the calcium retentions found in normal breast fed infants by previous investigators are insufficient to maintain the relative calcium content found in the body at birth. The calcium retention of premature infants may be small during the first two to four months of life, which fact, in combination with the rapid growth of these infants, must result in a more than normal decrease of the relative calcium content of the body, with resulting injury to the bone development. The phosphorus retentions of normal infants have been found to be larger than the retentions of calcium during the first three months of life. The prematurely born infants retained phosphorus in nearly normal amount in many cases. The calcium retentions of the prematures were, as a rule, of normal magnitude only in those cases where the intake exceeded one fifth of a gram of calcium oxide daily. This fact seems to indicate that the calcium minimum of these infants is of about the same magnitude as that of infants born at full term, and that the demands of the internal metabolism are of greater moment than the demands of the growing bones. When the calcium intake is less than one fifth of a gram of calcium oxide daily, the intake is for the most part, it seems, absorbed by the internal metabolism, and only a small amount is available for retention.

Tuberculosis and Pregnancy.—Heinrich Pehan (*Wiener klinische Wochenschrift,* October 5, 1922) concludes as follows: 1. Tuberculous affections that have run their course and those that are not progressive afford no indication for the artificial interruption of pregnancy. 2. Pregnancy, labor and the puerperium cannot induce a flaring up and further advance of an existing tuberculous affection; in such cases, the artificial interruption of pregnancy may be taken into consideration after a prolonged observation of the patient, but this must be fortified by physical examination, röntgenography and control of the body weight and temperature. 3. The outlook of success is dependent upon the severity of the disease and the duration of the pregnancy; the interruption of the pregnancy up to the beginning of the fourth lunar month and the first stage of tuberculosis (Turban classification) affords the most favorable results, but nevertheless these cases should be judged prognostically by their anatomical character. The complication of laryngeal tuberculosis is an indication for the interruption of pregnancy in the early months. 4. The interruption of pregnancy in the second half of the term, the particularly in the last lunar months, is no less dangerous than at birth at the normal period.

Prenatal Hygiene and Problems of Maternity and Child Welfare.—W. M. Feldman (*British Journal of Children's Diseases,* October-December, 1922) states that prenuptial clinics should be established where persons of both sexes can get expert advice in regard to their fitness to marry. No person knowingly suffering from syphilis should be allowed to marry and the breach of such a rule should be made a penal offense. Every person who has at any time been exposed to the risk of contagion by venereal diseases should be declared free from both syphilis and gonorrhea before marriage. All cases of prenatal syphilis should be thoroughly supervised and treated as soon as diagnosed. All expectant mothers should, as far as possible, refrain from alcohol (at any rate to excess) or excessive smoking throughout pregnancy. All expectant mothers should be protected from exposure to infectious diseases or dangerous industries, such as lead and phosphorus, or tobacco factories. Attention to teeth, bowels and kidney functions is of great importance during pregnancy. The relative size of the fetus and maternal pelvis should be carefully watched and any abnormal presentation should be converted into a vertex before labor. Antenatal wards or beds should be provided in connection with all antenatal clinics for the purpose of treating abnormalities of pregnancy, as well as for the purpose of carrying out properly directed and well coordinated biochemical, pathological and statistical research.

Intranatal Deaths.—Eardsley Holland (*British Medical Journal,* September 30, 1922) asserts that at postmortem examinations, fifty-one per cent. of fetal deaths may be traced to the complications of labor, as shown by the presence of cerebral or visceral hemorrhages. The tentorium cerebelli was found torn in half the cases and in eighty-eight per cent. of dead fetuses after normal breech delivery. In the light of such evidence, the teaching that the delivery of the aftercoming head must be hurried for fear of pressure on the cord must be revised, inasmuch as the fetus is actually killed by compression of the head, principally due to forcible efforts to complete the extraction of the child: the head may be allowed as much as ten minutes, if necessary, for delivery.

Malignant Chorioepitheliomata.—Theodor Nagy (*Gyógyászat,* July 3, 1921) in explaining the development of chorioepitheliomata says that the most difficult point of explanation is the transformation of the epithelium and villi of the chorion into malignant tumor cells. The embedding of the ovum in the uterine wall and the establishment of intercommunicating material and fetal circulation through the mechanism of the villi and uterine vessels are well known. However, a more particular knowledge of the process is still lacking, to determine whether maternal blood colloids pass through the placental vessel walls, thus, by means of the maternal albumin, building up the embryo, or whether those colloids must first undergo a process of assimilation. Investigations have shown that frequently villi of the chorion are carried away into the different organs of the mother. It is not so long ago that eclampsia was explained on this basis. But postmortem examinations have shown that these miscarried villi, or such as have degenerated into moles, are not necessarily transformed into chorioepitheliomata. Many factors may play the etiological rôle in encouraging and accelerating the development of these new growths, which are more malignant than sarcoma. Sometimes, while the primary focus shows no symptoms, metastases occur to such an extent as to obscure the primary site of the disease. It is also possible for the original focus to disappear before the patient consults the clinician.

Results of Radiotherapy in Cancer of the Uterus.—W. S. Flatau (*Zentralblatt für Gynäkologie,* May 12, 1923) finds that if the irradiation treatment is extended into several series over a long period of time, many patients, for some reason or other, do not return for treatment. He therefore believes in an intensified form of treatment with irradiation, and advances the following requirements: 1, the greatest possible homogenization and hardening of the ray cone; 2, irradiation of the entire pelvis (uterus, ligaments, lymph tracts, lymph nodes and connective tissue) through a single field; and 3, simultaneously or immediately preceding or immediately subsequent combination of excentrically applied and concentrically active distant röntgenization and concentrically applied and excentrically active radium treatment. The author uses fifty mg. of radium within the cervix for forty-eight hours; fifty mg. of radium in the vagina for twenty-four hours; and immediately preceding or immediately subsequent to this treatment he applies irradiation to the entire pelvis by means of four distant fields, one dorsal, one ventral and two lateral. In twenty-two operable cases, seventeen patients are living and in forty-six inoperable cases, twelve patients are living. For röntgen intoxication the author advises the administration of a teaspoonful of sodium chloride immediately after the irradiation.

Standardized Dose Method of Using Scopolamine Morphine During Labor.—N. Hirschman (*British Medical Journal,* October 14, 1922) finds that it is the morphine that causes the analgesic effect in the mother primarily and allows the scopolamine to take effect. A second dose of morphine is not necessary, but if for some reason or other it does become necessary, the physician should make sure that the child will not be born in the danger period, namely, from two to three and a half hours after the last injection of morphine, as a child born at that time is very oligopneic. A smaller dose of morphine—for example, heroine one twelfth grain—although producing less amnesia or analgesia in the mother, will not cause this oligopnea. The danger period can be avoided by combining 1/150 grain atropine with the initial injection of morphine scopolamine. On the whole, the author obtained his best results in primiparæ and multiparæ with an initial dose of morphine one quarter grain, scopolamine one one hundredth grain, and atropine one one hundred and fiftieth grain, followed by one four hundredth grain of scopolamine hourly. Instead of one quarter grain morphine, the author thinks one half or two thirds grain omnopon would be better. The initial dose of morphine should be from heroine one twelfth grain to omnopon two thirds grain, depending on how long labor is expected to last. A nurse, experienced with the twilight sleep technic, should be in constant attendance. This treatment is particularly indicated in primiparæ and in cases where a lengthy severe labor might be expected. It also saves the doctor much trouble and allows him to attend to his other duties. Chloroform should be given only at the end of the second stage, not only for obstetrical reasons but also because it prevents "islets of memory" or impressions on the brain. With ordinary reasonable care, there need be no untoward effects on the mother, and little, if any, on the child.

Maintenance of Obstetrical Anesthesia by Means of Infundibulin and Chloroform.—A. F. Martin (*British Medical Journal,* October 14, 1922) states that the parturient woman, being peculiarly amenable to the action of chloroform, can be rendered amnesic by maintaining a light partial anesthesia, which is harmless to mother and child, if the uterus is kept active by means of repeated small doses of infundibulin. Usually 0.5 c. c. of infundibulin every half hour or so is enough, the chloroform being administered with the onset of and during the pains. A Junker inhaler is a valuable help in avoiding the use of too much chloroform and in regulating the dose. The amount used will vary, the author having achieved a satisfactory amnesia with a minimum dose of three drams every hour.

Lumbar Puncture in the Treatment of Eclampsia.—Th. Heynemann (*Zentralblatt für Gynäkologie,* February 3, 1923) says that lumbar puncture has been discontinued in eclampsia, in which disease it was formerly frequently used, becomes the base of the brain and the cauda equina might be pushed downward owing to the increased intercerebellar pressure. The author reports several cases in which he was enabled to achieve a rapid improvement or elimination of the brain symptoms with the aid of lumbar puncture. Inasmuch as he is one of those who believe that eclampsia is due to disturbances in metabolism, he naturally does not consider the lumbar puncture as etiological therapy, and consequently he considers it to be indicated only after venesection and delivery of the child have failed and, particularly, when cerebral symptoms, such as convulsions and disturbances in vision, exist. Lumbar puncture should be done with the patient lying down.

Lesser Cæsarean Section.—Heinrich Doerfler (*Zentralblatt für Gynäkologie,* February 10, 1923) calls the interruption of pregnancy and sterilization done at one time "lesser Cæsarean section." He opens the uterus with a transverse incision immediately above the cervix, which he covers later with the vesicouterine fold and then removes the fetus with the finger and the amniotic membrane and remains of the placenta with a dry compress. He does not cut the tubes for the purpose of sterilization, but sterilizes in a bloodless manner, by lifting the tube up, piercing the resulting fold of mesosalpinx several times with silk, throwing a sling around the elevated tubal portion, and knotting the tubal coil with the thread. He then draws the ligated tubal coil into the mesosalpinx and buries it there. As a result, that portion of the tube which is tied off degenerates. In this way the dangers of the ordinary induction of abortion and the subsequent second operation of sterilization are diminished. The operation at one sitting is a great boon to the patient.

The Socalled Preliminary Irradiation Treatment of Carcinoma of the Cervix Uteri and Subsequent Operation.—A. Mayer (*Zentralblatt für Gynäkologie,* October 7, 1922) for a long time has treated carcinoma of the cervix uteri with considerable success according to the following plan: Only in those cases showing no ichorous purulent discharge were the patients operated upon immediately; in those cases showing such a discharge the patients were irradiated first and operated upon only after the discharge had disappeared. In sixty-seven cases treated according to this plan (radiated first and then operated upon, ten; operated upon immediately, fifty-seven), the primary total mortality was 7.4 per cent (as compared with 20.3 per cent formerly) and the mortality from peritonitis was 4.4 per cent (formerly 10.9 per cent), thus showing the justification for preliminary irradiation.

A Clinical Study of Cancer of the Uterine Cervix.—James W. Ross (*Canadian Medical Association Journal,* November, 1922) says that in very early cases of cancer of the uterine cervix treatment by surgery alone gives good results; surgery in combination with radium gives slightly better results than surgery alone. In operable but not early cases treatment by surgery alone or combined with radium gives the best results. Radium alone and the Percy cautery alone are of equal value and both less efficient. In cases considered inoperable because of extension to the vagina surgery gives the best results and radium is disappointing. In inoperable cases radium, alone or in combination with cautery or surgery, is the only effective agent. In advanced cases radium is superior to all other methods, but is not curative. The incidence of fistula is higher with the Percy cautery than with any other method.

Solid Carcinoma of Ovary.—M. R. Hoon (*Annals of Surgery,* December, 1922) offers the following conclusions: Solid carcinoma of the ovary may occur at any period of life from childhood to senility, the most common period being in the fourth and fifth decades. The tumors are highly malignant and are more often primary than the recent literature indicates. Solid carcinoma of the ovary may be bilateral, but in sixty-six per cent of the cases the tumor was unilateral. Melanotic carcinoma is occasionally primary in the ovary, and is highly malignant, as is the same type of tumor elsewhere. The general history is similar to that of ovarian fibroma, with the additional symptoms of malignancy, loss in weight, strength, and appetite, and secondary anemia. The growth of the tumor is usually rapid. Ascites cannot be considered a criterion of malignancy, as it was present in thirty-five per cent of the solid carcinomata and in twenty-five per cent of the benign fibromata. The treatment of solid carcinoma of the ovary is surgical removal followed by röntgen ray and radium, if total removal of malignant tissue is impossible. Metastasis and local recurrence indicate a hopeless prognosis, but palliative treatment may be given by radium and the röntgen ray.

Mixed Tumors of the Uterus.—A. J. Petersen (*Journal of Laboratory and Clinical Medicine,* March, 1923) adds to the recorded cases of mixed tumor of the uterus two instances. In the first case the sections of the tumor showed bone, hyaline cartilage, smooth muscle, white fibrous connective tissue, and alveoli of round and spindle cells. The patient died three months ofter operation with recurrence of the tumor in the pelvis (one year after the appearance of symptoms). The second tumor showed cartilage and smooth muscle fibres, fibrous tissue, but the greatest proportion of the tissue was areolar tissue. The patient was living and well two years after operation and six years after the appearance of symptoms.

Pathology of Fetal Maceration.—Gilbert L. Strachan (*British Medical Journal,* July 15, 1922) draws the following conclusions from a study of twenty-four cases: 1. Maceration is the result of the retention of a dead fetus *in utero,* the particular cause being an insignificant factor. 2. Maceration alone is no indication of the existence of syphilis. 3. The examination of the placenta is absolutely necessary. 4. The bony changes in the macerated fetus superficially resemble the chondroepiphysitis of syphilis and this condition must be carefully differentiated. 5. The microscopical examination reveals a process of autolysis of the constituent cells of the various organs with edema of the interstitial tissue and an extrusion of red blood cells. 6. In syphilitic cases, the placenta is thick and pale, whereas nonsyphilitic often show hemorrhages and infarctions.

Febrile Abortion.—Hermann Steichele (*Zentralblatt für Gynäkologie,* September 21, 1922) is in favor of assuming a middle position between radical and conservative treatment in cases of febrile abortion. Every case of febrile abortion is at first let alone, but if hemorrhage occurs as a result of the placental remains not being expelled completely, the uterus should be evacuated as gently as possible with a forceps and a dull curette. In the presence of peritonitic symptoms and suspicion of a perforating injury, every attempt at evacuation of the uterus should be avoided.

Metabolism in Pregnancy.—E. J. Cornell (*Surgery, Gynecology and Obstetrics,* January, 1923) asserts that from the findings in this series of cases the following conclusions may be reached: There is an increase in the metabolic rate above normal in pregnant women. It has a wide variation, however; there is nothing approaching a constant. The test is subject to many errors beyond the control of the technician. The mental attitude of pregnant women is not stable, therefore the readings are not always reliable. Many tests in the experiment were not included in the report because of the hysterical condition of the patient at one or both tests. The results in toxic cases were so variable that no reliable information was obtained. We could lay down no rule to guide us in determining the degree of toxicity or recovery in a given case. Neither could we say from the reading that labor should or should not be induced. The death of the fetus cannot be predicted from the metabolic rate. The test consumes considerable time, effort, expense, and patience far out of proportion to the value of the information obtained.

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Albuminuria in Pregnancy.—Aleck W. Bourne (*Practitioner,* September, 1922) submits the patient to medical treatment for four days, of which starvation for the first twenty-four hours plays a prominent part. Should there be no improvement in any of the symptoms on the fourth day, he thinks it wise to induce labor without further delay. Many patients show a decided improvement, and they may be allowed to progress a little further in pregnancy should the child's interests demand a further period *in utero,* but should the child have reached a development of thirty-eight weeks labor should be induced after a few days of detoxication. If a toxemic patient exhibits any one symptom in a pronounced degree, such as excessive edema, a blood pressure above 190 m m., or albuminuria of two per cent. or over, labor should be induced after not more than two days of medical treatment. Some symptoms, such as uncontrollable vomiting in late pregnancy and jaundice, are especially dangerous and indicate immediate termination of the pregnancy. A sudden exacerbation of a symptom already present, or the appearance of a fresh symptom, during medical treatment, demands the immediate induction of labor. Finally if there is doubt about the diagnosis of true toxemia or chronic nephritis and pregnancy, the pregnancy should, in most cases, be ended at once. In a patient who is going to do well the headache and edema subside coincidentally with an increase in the quantity of urine and a reduction in its specific gravity. The amount of albumin usually diminishes, but seldom disappears until after delivery. The diminution of albumin to a faint cloud is a good sign but does not signify that the patient is out of danger. The blood pressure usually falls a little in twenty-four hours, if the patient is in bed and undergoing depletive treatment, but is slow in subsiding to normal. It usually remains above normal for a fortnight after delivery and the disappearance of all other symptoms.

Treatment of Atonic Hemorrhages in Cæsarean Section.—W. Sigwart (*Zentralblatt für Gynäkologie,* November 18, 1922) states that hot irrigations, the Momburg belt, or the Sehrt clamp are available for atonic hemorrhages if the birth takes place through the natural passages, but in a laparotomy these procedures are applicable only with great difficulty. On the basis of his observation that the introduction of anesthesia ether into the laparotomized abdomen produces intestinal peristalsis, the author poured about fifty c. c. of ether into the uterus in several cases of atonic bleeding in Cæsarean section. The result was a stony hard contraction of the uterus. Simple rubbing of the external surface of the uterus with gauze wipes soaked in ether was also effective and more advantageous than the usual massage of the uterus. The special advantages of this procedure are the simultaneous disinfecting effect and the diminished hemorrhage with subsequent excision of the angle of the tube.

The Kielland Forceps in Obstetrics.—Rudolf Stiglbauer (*Wiener klinische Wochenschrift,* October 19, 1922) states that the advantages of the Kielland forceps are the following: 1, the straight form of the spoon, with only a slight curvature of its edges, by means of which the head of the fetus may be grasped transversely by avoiding its application in an oblique diameter; 2, the gliding lock, which allows the fitting of both blades in any position without the application of force; and 3, the slight width of the forceps at the junction of the spoon and the handle, whereby every millimetre of unnecessary distention of the soft parts is avoided. It is a vast improvement over all the models of forceps in use heretofore; its manipulation is easy and it spares both mother and child any unnecessary injury.

Experiences With the Kielland Forceps.—E. Neumann (*Zentralblatt für Gynäkologie,* February 3, 1923) reports on his experiences with the Kielland forceps, which are of particular interest because nearly all of the patients showed a contracted or flat pelvis, the head being up high or impacted in the pelvis and not rotated. With few exceptions, the anterior and posterior spoons could be introduced immediately, anteriorly and posteriorly; only once was elevation of the posterior spoon past the promontory difficult and once the anterior spoon could only be turned in the uterus. The introduction of the spoon in the transverse diameter, as with the classical forceps, and allowing it to accommodate itself, is not so easy. The typical application of this forceps usually causes no difficulties. The rotation of the head by 90° or 135° is almost always exceedingly easy, provided the forceps is properly applied. A slipping of the forceps is possible only with a faulty application. High forceps extraction in a narrow pelvis may be done with little force. The Kielland forceps is, therefore, highly recommended both when the head lies up high and also as a rotation instrument and also as a substitute for the Naegeli forceps in typical operations, not only in normal, but even in contracted and occasionally in flat pelves. However, the Kielland forceps should never be used by the general practitioner, but only by the specialist.

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The Etiology of Gout

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It was with many misgivings that I acquiesced in the suggestion that I should open a discussion on gout—that riddle of the ages—the elucidation of whose etiology has vexed the minds of all thoughtful physicians from time immemorial. For our forefathers were well aware of the profundity of the problem.

"A knowledge of the real nature of gout is, in my opinion, at the very foundation of all sound pathology," said Tod, many years since, and the passing years have but invested his reflection with deeper significance and something of prophetic insight.

For, who can doubt that he who would unravel the pathological groundwork of gout, must be at once a clinical physician, a biochemist, a bacteriologist, a morbid anatomist, and well may we ask, who is sufficient for all of this?

It is with chastening reflections such as these that we may best approach that vexed question—the etiology of gout. For though our knowledge of the chemical structure of uric acid, and its allies, has of late vastly increased, nevertheless we are far from the solution of the pathological mystery of gout.

HEREDITY.

Now as to the etiology, both intrinsic and extrinsic agencies are involved. Of the intrinsic the most salient is heredity, and as Fuller aptly says, "From father to son, its seeds are transmitted, and bear fruit in exact proportion to the degree in which circumstances prove favorable to their growth."

That gout is hereditary is beyond question, but whether purely so, or capable also of acquisition *de novo,* is uncertain. Certainly of all arthritic diseases, gout furnishes by far the most instances in which parents and children are alike victimized.

Thus Garrod, Ooberts, and Luff in private patients found an ancestral taint in from seventy-five to eighty-one per cent. Albeit they maintain that gout can be acquired *de novo*. Personally I find it difficult to appreciate their attitude. They insist on innate or static proclivities in gout, and in the same breath are equally insistent that it may be acquired *de novo*. As to the evidence adduced, it is negative rather than positive, based mainly on failure to establish any ancestral tendency.

But seeing that they elicited an hereditary influence in three fourths or more of their cases, is it not probable that the same taint—though apparently undiscoverable—was at work in the residual fourth? Is not this more likely than that in their particular instance the disease was newly and wholly acquired?

Personally I believe the alleged acquisition *de novo* of gout to be apparent rather than real. My own opinion is that the predisposition thereto is always inherited, and that the factors we presume may originate gout, are merely evocative, not causative. In other words, the primary or essential cause of gout is an inborn morbid tissue potentiality, in the absence of which the alleged predisposing or exciting causes are impotent to evoke the disorder.

Apart from statistics how otherwise can we explain the fact that of a large number of persons given to precisely those alcoholic and dietetic excesses that we presume may create the disorder, not one may develop gout, while others who lead literally "A godly, sober, and righteous life" are veritable martyrs thereto. How escape then the conviction that in gout "breed is stronger than pasture"?

It is not gout, of course, but the predisposition thereto that is inherited. Moreover, the morbid potentiality lies latent, unless evoked. Thus females of gouty stock, infinitely more often than not, escape overt gout, but hand on nevertheless their inborn liability to their offspring. Seeing then that gout may lie dormant for a generation, is it surprising that in some cases, admittedly a minority, the family history proves sterile?

Again, the presumption that gout is purely hereditary gathers weight when we recall that its metabolic eccentricities relate to nuclein rather than protein metabolism. For, it is in nuclear changes that we may best discern the initiation of oxidation processes and other varieties of enzymatic activity. Moreover, as Walker Hall points out, "The presence of masked iron, phosphorus, and certain forms of fat in the cell nucleus strengthens this view, and thus we are

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led to recognize the important part played by the nucleus in the life of the cell, and to appreciate the influence of nuclein heredity in cellular exchanges."

Again, turning to the end product of nuclein metabolism—uric acid—do not its anomalies of excretion and deposition also seem to predicate inherited nuclear peculiarities, with their correlated perversions of function? That such constitute the pathological groundwork of gout is, I think, further indicated by the fact that socalled gouty inflammation—in virtue of its associated uratic deposition—is *sui generis.* No tissues, other than the gouty, react in this specific fashion. Does not this seem to indicate that the soil—the inborn tissue peculiarities—dictate, so to speak, the character of the pathological reaction? This indifferently, whatever the nature of the socalled predisposing causes which—if my assumption be correct—do but evoke or make manifest what is already latent.

Assuming that gout be purely hereditary, what is the nature of the morbid potentiality transmitted? Some define it as an inborn defect or alteration of protein or nucleoprotein metabolism. But, pending more exact knowledge, I would by preference ascribe it to inherent instability thereof. Instability predicates excessive or abnormal response to normal stimuli, and judged clinically this is the salient characteristic of the gouty, in a word, hypersensitiveness. How otherwise explain their manifold idiosyncrasies in respect of foodstuffs, alcoholic fluids, drugs, etc.?

Nowadays persons who exhibit idiosyncrasies towards foodstuffs, etc., are regarded as anaphylactic thereto. But be this as it may, much of the recent research on anaphylaxis centres around asthma, a disorder whose kinship with gout is traditional. In the matter of heredity, they are very reminiscent one of the other. Thus the son of a gouty parent, happily warned by the excesses of his father, may remain immune, while in turn his son, forgetful of his evil heritage, may bring it again to fruition. In like fashion a father, though himself free from asthma, may transmit to his children the tendency to protein sensitization, bequeathed him by his forbears.

Now protein sensitization being, so to speak, the live link in asthmatic heredity, is it not highly probable that the hereditary transference of gout also connotes the transmission of a tendency to nucleoprotein or rather protein sensitization. I say protein, because researches show that any antigenic properties that nucleoproteins possess are referable to their protein and not their nuclein moiety. For apparently purified nucleins are not antigens, at least not in the ordinary sense. For none of their constituents, nucleic acid or other, seem to possess antigenic properties.

I would then suggest that the live link in gouty, as in asthmatic heredity, is the transmission of a tendency to protein sensitization. I have the less diffidence in that more often than not, gout develops on a soil already sensitized, as betokened by the fruit already borne in the shape of asthma, urticarial and eczematous eruptions, or some one or other of the toxic idiopathies. These we know to be due to protein sensitization, and when we recall how frequently these precede articular gout and alternate therewith, is it not highly probable that arthritic gout is but another clinical variant thereof?

The suggestion gathers weight when we recall the many clinical analogies between gout and asthma. Thus both disorders are paroxysmal and periodical, prone, moreover, to clinical interaction and alternation, and their victims notably given to idiosyncratic reactions. The resemblance goes even deeper, for de Kleijn and von Leeuwin have recently noted that bronchial asthmatics exhibit the same disturbances of purin metabolism met with in gout, viz., retention and delayed excretion of exogenous purins. Moreover Czerny, Paltauf, and others assert that the children of gouty stock are especially liable to a symptom complex marked by asthma, cyclical vomiting, vasomotor ataxia, and eosinophilia. The asthma may alternate with urticaria and eczema, and moreover as Uffenheimer emphasizes, these children again display the same disabilities of purin excretion as their gouty parents.

FOOD IDIOSYNCRASIES.

I would remind you in this connection that Duckworth long since observed that the food idiosyncrasies of the gouty often began in early life, and with the passing years might die out and be replaced by other idiosyncrasies. Moreover, the *pari passu,* their liability to certain disorders showed a like periodicity. Recent studies on protein sensitization strikingly confirm these observations.

The sensitiveness which in infancy finds expression in eczema may later be exchanged for sensitiveness that manifests itself in asthma, and as I think myself, may later still in life take the form of regular gout. For, if it is true that many cases of asthma beginning in early life, date from the suppression of an eruption, it is equally true that an asthmatic paroxysm has vanished with the onset of frank gout, and that thereafter the gout has alternated with asthma or with eczema, or with urticaria. Herein may lie the explanation of the hitherto inexplicable interplay of regular and socalled irregular or abarticular manifestations of gout. In other words, that these various disorders superficially so dissimilar, are but multiple expressions of one species of morbid action.

The food idiosyncrasies of the gouty are proverbial, not eclipsed even by the asthmatic. Some appear hypersensitive to beef, others to pork or veal, some to shell fish, others to certain vegetables or fruit, e. g., strawberries. The almost fulminant swiftness of the response in some instances frankly suggests that the gouty outbreak is due to the absorption of unaltered protein, and moreover, the digestive derangement of the gouty would seem to favor the intrusion of unaltered protein or cleavage products.

Here I would protest against the belief that the idiosyncrasies of the gouty relate chiefly, if not entirely, to nuclein rich foods. Sweetbreads, it is true, in some evoke outbreaks, but others take them with immunity. In short, the response of the gouty to a purin free diet is undeniably erratic, which is not surprising, seeing that it was based on the assumption that uric acid was the *fons et origo mali* in gout.

It is asserted that it reduces the degree of uricemia, and therefore the attacks of gout. But variations in the degree of uricemia occur independently of diet, and acute outbreaks ensue, even when as the result of atophan the uric acid blood content is subnormal.

Apart from these discrepancies the prime drawback of the purin free diet is, that it does not exert a direct or specific influence on the *causa causans* of gout, but only upon the results thereof. For we now realize that the uricemia and uratic deposits are but symptomatic of gout—the outcropping, so to speak—of some more profound metabolic disturbance.

But if so, then to what may the variability in response of the gouty, not only to a purin free, but to all other standardized diets be ascribed? The reason, if I may suggest, is that—indifferently whether the diet be rich or poor in nucleoproteins—t is not the nuclein, but the protein moiety thereof that is the disturbing element, the responsible antigen.

In other words, the salient point is, not whether he diet be purin free or what not, but does in either or any instance contain the specific protein or proeins to which the particular gouty individual is hypersensitive. Only on this more catholic basis can we hope to cope with the food idiosyncrasies of the gouty, which extend far beyond nuclein rich foods.

Thus, for example, strawberries being purin free, are admitted to a purin free diet. Yet it is notorious that some gouty, like some asthmatic subjects, are hypersensitive thereto, developing urticaria or frank gout. Nevertheless many gouty persons, like Linnaeus, eat them with impunity. The inference then s that some gouty persons are hypersensitive to the particular protein in strawberries, others not.

If this be true of strawberries, what of the proteins in other purin free substances? For turning to the elements of a purin free diet, we find them rich in those proteins that evoke asthmatic paroxysms, viz., wheaten bread, milk, eggs, rice, etc. Now if so in asthma, why not in gout? The question seems more relevant when we recall that bronchial asthmatics are subject to the same disabilities of purin excretion as the gouty. Indeed for this same reason de Kleijn and von Leeuwin placed their asthmatics on a purin free diet. Here again, as in gout, the results were conflicting, some benefitted, others not.

Unfortunately those who proved obdurate were not subjected to protein skin tests. But, judging from other workers' findings, they would have been found hypersensitive to wheat, or other proteins. The same reasoning I submit would explain the erratic response of the gouty to a purin free diet, viz., in those who benefit the protein to which they are hypersensitive has unwittingly been abstracted. Conversely, in those who do badly, there remains an unguessed at sensitization to cereal or other proteins.

I would suggest, then, that the food idiosyncrasies of the gouty, are due to protein sensitization, and hat the disturbances in nuclear metabolism are secondary thereto. I have less diffidence since experimental researches show that purin free proteins, viz., glidine, markedly stimulate nuclear metabolism with ncreased output of endogenous uric acid. Moreover, the same follows ingestion of the end products of protein digestion, e. g., the amino acids, i. e., alanine, and glycocoll, also the bicarboxylic amino acids, i. e., glutaminic and aspartic acids.

This fact that purin free proteins or their derivatives markedly intensify nuclein metabolism furnishes, I think, a clue to the food idosyncrasies of the gouty. Incidentally, the increased nuclear catabolism might account for the tendency to uricemia—the degree of which has possibly some bearing on that more salient feature of gout—uratic deposition.

Again, not only do the most diverse proteins apparently evoke gout, but wholly alien substances, such as lead, exposure to x rays, and last but not least, infections. Surely nothing could more clearly demonstrate the abnormal or specific instability of the gouty. Be it food, drink, lead, or what not, every gouty man has his own peculiar antigen or antigens.

Moreover, as to diet, if it is to be more satisfactory, we must take cognizance of more than nuclein rich foods. In truth, our attitude must be at once more catholic and infinitely more eclectic. Our net must be wider spread, but its mesh exceeding small. For in gout, as in asthma, every man is a law unto himself.

Passing to alcoholic fluids, Sir Clifford Allbutt in a recent contribution on gout observes, "Let us protest against the equivocal use of the word 'alcohol' when we mean wines or ales. There is no evidence," he adds, "that alcohol does more harm to the gouty than it does to other people. We are all better without spirits."

Le Gendre also holds that alcohol *per se* cannot originate gout, but probably that something in wines or beers has eluded us, some associated substance. Now, if we cannot impeach the alcohol, then to what other constituent can we refer the gout evoking properties of malt liquors and wines as opposed to distilled spirits?

The elder Garrod long since observed that "Neither the acid nor the sugar, nor any known principle in wines or malt liquors, can as yet be proved to impart to the alcohol its predisposing influence. For wines the least acid, and liquors the least sweet, are among the most baneful."

Now, comparing malt liquors with wines one difference emerges. Malt liquors contain purins, while wines are held purin free. Yet both are equally provocative of gout. Albeit, we know that nucleic acid, the mother substance of purins, has no antigenic properties.

Is it then a question of personal idiosyncrasy? Apparently so, for of the multitude of beer drinkers, but a tithe have gout. Moreover, even in gouty subjects, beer does not infallibly evoke an outbreak. Sydenham, indeed, advocated mild beer, and Burney Yeo insisted that some gouty subjects drank stout with impunity. Obviously then, it is essentially a question of personal idosyncrasy. In other words, those beer drinkers—relatively few—who do have gout, are sensitized or hypersensitive to something in the beer other than its alcohol or purins. To what then are they hypersensitive?

I suggest, to the proteins in beer, viz., to hordein, or some other protein in malt. I single out hordein for—like glidine and other vegetable proteins—it produces a typical anaphylactic reaction. Another possible source of sensitization might be the protein material in yeast cells, for dry yeast contains fifty per cent. of nitrogenous substances, proteins, peptones, etc.

Passing the wines, these like malt liquors are the product of fermentation, produced spontaneously by the yeast cells always present in the grape. The saccharomyces ellipsoideus is the type of yeast responsible. Of this there are many species or races, only to be differentiated physiologically. This allows of varieties of yeast proteins being concerned in the maturation of different wines.

Now, though in the course of racking, yeast cells subside to the bottom of the cask, nevertheless, Julius Wortmann elicited this fact. He examined a large number of old wines, and invariably when the wine was still in good condition, he found living yeast cells always present.

Now, seeing that the varying characters of individual wines admittedly depend largely on the particular yeast concerned, may we not here find a clue to the erratic response of the gouty to this or that wine? In other words, why some can stand champagne, others port, and yet both come to grief on the reputed more innocuous claret or hock.

If living yeast cells are always present, even in old wines in good condition, is it not possible that those who manifest gout after their consumption are hypersensitive to one or other of the proteins contained in the different races of yeast cells? Apart from this, we know that in the process of fining wine, protein substances are actually added, in white wines such well established antigens as casein and skimmed milk. In contrast, red wines are often treated with white of egg. I suggest then that the wine idiosyncrasies of the gouty are due to protein sensitization, either to proteins developed during fermentation of the grape must, or added subsequently in the process of fining.

OCCUPATION.

In persons who are predisposed, exposure to lead may evoke gout, and this by several routes. It may follow its ingestion in medicinal doses. Again, it has ensued through the inhalation of snuff taken from lead packages, or it may be the result of absorption via the skin or mucous surfaces. Munro saw an initial outbreak occur within two days of resort to a hair wash containing lead. Now, if a metallic poison like lead can by its inhalation or absorption evoke gout, why should not the proteins of barley or other cereals in some instances act in like fashion?

I say so having been struck with the fact that—apart from those directly concerned with brewing and malting—gout develops with significant frequency in those whose work involves the mere handling of grain. Judging from statistics, gout is as common among coachmen, grooms, stablemen, and farm laborers as in draymen, maltsters, brewers' laborers, and so forth.

Now it is a strange thing if we meet with gout in a lead worker, we impeach the lead and not the beer which he may and often does drink. On the other hand, if we meet with gout in a maltster or drayman, it is ever and always the beer he drinks. But not all publicans are sinners. Moreover, we admit that the lead worker may acquire his gout by inhalation or absorption through skin or mucous membrane. Then why discount the possibility that the drayman or ostler may acquire his gout also by more innocent routes than the alimentary canal.

Again, Wilson Fox long since noted that some persons, when exposed to lead fumes, developed not gout but asthma, and so we have this same metal lead, evoking in one individual gout, and in another asthma. Now, cereal proteins we know may by inhalation or absorption in some persons induce asthma, then why should they not, in other instances, like lead, evoke gout, and this by direct contact?

It seems not so improbable when we recall that the proteins of strawberries may in one evoke gout, in another asthma. But to my point, as to the possibility of sensitization by these alternative routes in the brewing trade. Barley is, of course, the cereal usually employed, and the technic of malting, grinding etc., is such that the hordein, or other proteins contained in the malt dust, might sensitize by direct contact. Again, the brewers' yeast or saccharomyces cerevisciæ—multiplying as it does by spore formation—might do the same. For the spores of yeast, like the ethereal pollen, are readily diffused by air currents.

Now we admit that sensitization with resultant asthma is especially prone to ensue when, as in millers or others, the protein comes into direct contact with the conjunctival, nasal, or respiratory membrane.

Is it not possible then that the socalled gouty throat is the outcome of sensitization by direct contact of the proteins in malt dust or yeast spores? If so, it would readily explain why a socalled gouty tonsillitis or pharyngitis, or according to many, a conjunctivitis or episcleral congestion so frequently and immediately precedes a classical outbreak.

I would suggest then that the predominant incidence of gout in the occupations mentioned above is that those in whom the disorder develops are sensitized. Moreover, that such sensitization may be but is not necessarily the outcome of the ingestion of beer. But, that being in the course of their work, exposed to the corresponding protein or antigen, sensitization, as in asthma, may occur by the alternative routes of inhalation or absorption of the proteins of malt dust, in brewing or malting, or of the proteins in crushed oats, wheat, etc., in stable and agricultural work.

For some deep etiological significance, I feel sure, attaches to the fact that not only do these two conditions, gout and asthma, so frequently overlap clinically, but that the trades also in which they predominantly occur should alike be concerned with the handling of cereal grains or other manufactured products.

Lastly, there is some evidence that even such widely divergent substances as lead and proteins act after a somewhat similar fashion. For though nonproteins like lead may not sensitize, it is suggested that they may combine with or alter the proteins of an animal so that they become as foreign proteins to that animal and so cause sensitization.

TRAUMA.

Fractures, dislocations, and surgical operations have very frequently determined gouty outbreaks. Now, our experience of war casualties suggests that in extensive traumatisms the products of tissue autolysis may engender grave intoxications, or conditions sometimes interpreted as shock. Researches on animal anaphylaxis seem to show that it is especially the slightly altered proteins, possibly only changed in their colloidal properties, that are most probably responsible.

But apart from extensive traumatisms, even trivial shocks such as extraction of a tooth, or vaccination, have determined outbreaks. In one case under Munro and myself, the initial attack occurred between two injections of typhoid vaccine. Unfortunately I have neither seen nor read of any instances in which gouty patients have exhibited extreme hypersensitiveness towards horse serum.

Lastly, in olden days leeching in gout was common. But it was found to lead to fresh outbreaks, and so abandoned. Is it not possible that the outbreaks were due to sensitization to a foreign protein derived from the leech? Such, too, might be the explanation of Heberden's classical instance, where he said he verily believed the attack had been excited by a gnat bite.

MENTAL STRAIN OR SHOCK.

The potency of mental strain or shock in evoking gout is historical, but its modus operandi obscure, but in the light of Pavlov's researches, there is no doubt as to the inhibition of gastric secretions by unpleasant psychic stimuli. In view of this it would seem probable that sudden mental shock or prolonged anxiety through the sequential gastric derangements might favor the intrusion of unaltered proteins or cleavage products, and in this way cause sensitization.

INFLUENCE OF SEASONS.

The tendency of gout to occur almost exclusively in the spring has been known since the days of Hippocrates. Its predilection for this period is difficult to explain, but I would remind you of Hamilton's researches on louping-ill or chorea paralytica as it occurs in sheep. It is a disease of the spring, and Hamilton noted that during springtime the blood of sheep affords an excellent culture medium for the responsible bacillus. At other seasons the blood is not only inimical to its growth, but intensely bacteriolytic thereto.

Is it not possible, also, that in man the protective mechanisms of the blood are lessened at particular seasons, so that the growth of pathogenic organisms in associated local foci, is in some subtle way favored. In other words, that microbes lying dormant in such foci become active, with the result that the cells of their host become sensitized to their proteins. For, to my mind, it is highly probable that sensitization to bacterial proteins is gradually developed in chronic infections, such as pyorrhea, etc., and this occurs more commonly in gouty than in normal persons.

THE INFLUENCE OF INFECTIONS.

It has long been recognized that a great number of disorders which we now know to be infective, frequently determine gouty paroxysms. Numerous instances, said Garrod, arising from boils and carbuncles have come under my notice. Moreover, modern observers all agree as to the frequency of local infective foci in gouty subjects. Lastly, the general features of acute classical gout, its paroxysmal nature, and periodicity, strongly suggest the intrusion of an infective element.

But even those who hold infection responsible for the arthritic phenomena, find it difficult on this basis, to account for the socalled irregular or abarticular manifestations of gout. But the difficulties seem minimized, if we take the view that focal infections evoke gout through the medium of anaphylaxis.

In other words, that the articular and abarticular phenomena of gout are due not to the direct action of toxins generated by organisms in some local focus, but that they are the outcome of an anaphylactic reaction to the proteins of the said organism.

Reflections on the anaphylactic symptom complex —reinforced by some peculiarities in socalled gouty arthritis, have led me to this conclusion. The salient features of anaphylaxis, as Dale has shown, are spasm or tonus of unstriped muscle, e. g., the bronchioles, and poisoning of the endothelial cells of the blood capillaries. Moreover, one or other of these effects may predominate in different species of animals, and thus give rise to symptoms which, though superficially dissimilar, are yet fundamentally due to the same species of morbid action.

That they are due to one common type of poisoning, is, in Dale's opinion, further confirmed in that these same symptom complexes may be produced by a whole group of natural poisons—partial cleavage products of proteins formed by bacterial or other ferments.

In like fashion in man—under natural conditions of life—there may occur that particular sequence of events essential for the artificial induction of animal anaphylaxis; in other words, an entry into the blood of unaltered or incompletely digested proteins—a definite interval—then a second entry with resulting explosion. When such occurs, the salient features of anaphylaxis are reproduced, and find clinical expression in asthma, skin eruptions, arthropathies, vascular hypotension, and eosinophilia. In some individuals urticaria, in others bronchial asthma, or arthropathies, may be the predominant manifestation.

Now, when we reflect on the varied clinical phenomena of serum sickness or anaphylaxis in man, they seem very reminiscent of gout, in its regular and irregular aspects. Thus, in both we have joint swellings, asthma, skin eruptions, and I think, the resemblance extends even to the vascular hypotension and eosinophilia.

The prevailing impression, I believe, is that in gout the blood pressure is raised, but I am sure there are many exceptions. Thus, Sir Clifford Allbutt recently observed. "Time after time, so far as palpation can go, I have found the accessible arteries, even of elderly persons, long liable to acute or chronic gout, soft to the touch, and the blood pressure moderate. I am disposed to say that on the whole the subjects of frank gout are not more liable to atherosclerosis than other persons of equal age."

As to eosinophilia, Neusser many years ago held it to be a feature of the blood changes in gout. More recently, Bain in a case of acute gouty polyarthritis noted a marked increase of eosinophilia, and Munro, in some cases of my own, observed a similar tendency thereto.

IRREGULAR MANIFESTATIONS OF GOUT.

Now, I may remind you that many of the currently regarded irregular manifestations of gout are frankly relegated to the group of toxic idiopathies, notably asthma, urticaria, and edema, also some types of gastrointestinal disturbance.

Now, if the irregular manifestations of gout are rightly so included, why not its regular or articular phenomena? For classical articular gout, to my mind, represents the very acme of idiosyncratic response, if only by reason of this salient fact that no other articular disorder is associated with uratic deposition. That we should exclude regular or articular gout from the toxic idiopathies is the more remarkable in that arthropathies are among the most common features of the anaphylactic symptom complex as portrayed in serum sickness. Moreover, it is generally held that the joint pains and swellings of serum sickness, like the urticarial and edematous lesions, are due to poisoning of the capillary endothelium. Hence, presumably the reason why they are generally referred to as arthropathies rather than arthrites; and I believe that in like fashion the joint swellings of gout would be more fittingly described as arthropathies than as arthritides.

For acute classical gout displays peculiarities which sharply contrast with the usual phenomena of arthritis. Thus, no form of arthritis is so definitely paroxysmal and periodical. Certainly none that repeatedly runs so definite and fixed a course, without subsequent adhesions. Again, in most forms of arthritis, the motor phenomena, muscular wasting, predominate. But in gout, sensory disturbances are to the fore, i. e., pain and perverted sensations. Lastly, it stands unique in virtue of the associated uratic depositions.

PREMONITORY SYMPTOMS OF GOUT.

Turning to the elements of a typical fit in the toe, I would first allude to the premonitory symptoms exhibited in the limb about to be attacked. These take the form of painful muscular cramps, sensations of coldness, or numbness along the limb, and objectively, engorgement of the veins not only of the foot, but of the leg, where the same marked turgescence is visible. If it be the hand that is attacked, this same preliminary engorgement of the veins of the arm is to be noted.

Now, the character of these symptoms distinctly suggests that the primary morbid change in oncoming gout is a disturbance of the circulation. The more so, seeing that in authentic instances urticarial or erythematous eruptions are sometimes superadded to these prodromata—these same vanishing with the onset of the attack as signalized by pain.

Now, for a few hours after its onset there is no outward change in the periarticular region, only the venous turgescence. Then the parts become red and swollen. The redness reaches its acme in about thirty hours, but the surrounding edema goes on slowly increasing for some four or five days. The vivid scarlet glazed appearance—suggesting pus where none is—later fades into violet, and with the passing of the fit the edema subsides, the cuticle peels, with subsequent itching and numbness of the foot that persists for some days.

Here are surely many anomalies difficult to reconcile with the orthodox evolution of an arthritis. But there are still further anomalies. Thus, the excruciating pain of gout has this peculiarity first noted by Sydenham. It may be conjoined with a feeling of icy coldness in the joint, or in contrast, a sensation of boiling heat. But the degree of pain and its subjective character seem independent of the local phenomena as estimated by redness, swelling, and local heat. Indeed, as Scudamore first noted, one of the cardinal signs of inflammation, calor or local heat is often if not always lacking in gout. Duckworth too, judging by the thermometer, noted that the local temperature of the joints involved in acute gout, is commonly lower than that simultaneously taken in the axilla or mouth, sometimes by five or six degrees.

The body temperature, too, displays remarkable vagaries. In socalled asthenic gout, though the joint be red and swollen, and the disease runs its usual course with subsequent desquamation, yet the temperature throughout is normal.

This incongruity is even more strikingly exhibited in acute gouty polyarthritis, where three or four of the larger joints may be painful, red, and swollen, and yet the temperature be normal. As Osler says, "A patient with three or four joints red, swollen and painful in acute rheumatism has fever, and while pyrexia may be present, and often is in gout, its absence is, I think, a valuable diagnostic sign."

To sum up, are we not here confronted with a series of events whose character and sequence is—even apart from the associated uratic deposition—specific or *sui generis*. I say so advisedly, for the subject of articular gout is not immune from other forms of arthritis. He often has acute rheumatism in early life, and at a later age, manifests acute gout, and either before or after this, he may have suffered from acute gonococcal arthritis.

Nevertheless, these alien joint disorders—despite the gouty soil—remain true to type. This shows that the joints of a gouty man—when exposed to the direct action of microbes or their toxins—do not necessarily or invariably respond with a uratic arthritis.

The inference, then, to my mind, is that for the production of a true gouty or uratic arthritis, there is required not only a specific gouty soil, but an equally specific mode of pathogeny. In other words, that a socalled gouty arthritis is not—as in gonococcal or other types—due to the direct action of microbes or their toxins, but is achieved indirectly, through the medium of some special morbid mechanism.

For myself, I believe that the initial change in acute gout is a toxic poisoning of the endothelium of the vessels and capillaries in the joint area. I note that Dale, discussing the action of histamine, holds that it embodies the main features of a reaction which, if it occurred locally would be construed as a mild inflammation. In continuance, he observes, the widening of capillary lumina, the opening up of channels, ordinarily empty, the transudation of plasma through abnormally permeable endothelium, and the tendency to stasis of the concentrated blood—these phenomena, when occurring in an area so restricted that the general arterial pressure is not materially affected, will produce the familiar sequence of redness, swelling, and edema.

Now, according to Dale, the foregoing circulatory changes are the outcome of vasoconstriction of the arterioles combined with vasodilatation of the capillaries and venules. As a result, we get obstruction to the inflow of arterial blood, and therewith stasis in the venules and capillaries.

Now, applying these to the elucidation of acute gout in the toe, we find a ready explanation of the premonitory symptoms, the coldness, numbness, muscular cramps, and venous turgescence, viz., that they are due to restricted arterial supply and venous stasis. Moreover, these occurring in a localized area such as the toe, we get the familiar redness, swelling, and edema.

The pain too is explicable as due to local ischemia, as likewise the subjective coldness, and absence of local heat, while presumably the subsequent desquamation, itching, and local numbness, would admit of a like explanation. Clinically, the supposition of circulatory stasis seems reasonable, when we recall that actual thrombosis of the veins leading from the affected part has indeed been noted during the actual progress of a paroxysm.

URATIC DEPOSITS IN GOUT.

Now, as to the associated uratic deposits. Even in gouty subjects there is as far as we know, no interference with the orderly sequence of enzymatic reactions eventuating in uric acid. But here comes the flaw—the uric acid when formed fails of transport and elimination. It is precipitated and anchored in the tissues, and I note that Sir Clifford Allbutt holds that uratic deposits never occur in sound tissues, cartilage or other. They are only laid down in the connective tissue substitutes. This being so, he maintains that inflammation, however slow and inactive, must be assumed as a condition precedent to uratic deposits.

Now, I have suggested that the local blood supply of tissues the seat of acute gout is reduced. A reduced blood supply results in increased H ion concentration. This greatly favors autolysis, which ensues chiefly if not solely in asphyxiated tissues. I would suggest then, that as a result of local ischemia the cartilage undergoes anemic necrosis, with secondary uratic deposition in the connective tissue laid down in its place.

Wells states that during autolysis the intracellular enzymes attack the protein group of the nucleoproteins, setting free the nucleic acids. These in turn, are disrupted by the specific enzymes nuclease, liberating the purin bases which again undergo further disruption. May it not be then that the uratic deposits are due to the inadequate removal of the substances resulting from these local nuclear activities, and that the relatively high sodium content of cartilage, determines the incidence of uratic deposits therein?

Moreover, as serum inhibits the action of the intracellular autolytic enzymes, it follows that with restoration of the free circulation, the tissue autolysis ceases.

CONCLUSIONS.

In attempting to summarize my views on this vast subject—the etiology of gout—I would remind you that Dale holds that sensitization—in anaphylaxis—is cellular and not humoral in location. In other words, that in vascular endothelial poisoning, the anaphylactic symptoms are not due to collision of the antigen and antibody in the blood stream. For his researches show that the antibody is located in the cell, and that it is there in the cell body itself, that the reaction with the corresponding protein or antigen occurs. Hence the anaphylactic symptoms—possibly the result of intracellular precipitation.

On this basis the pathological groundwork of gout resides in a tendency to cellular sensitization. The same may remain latent, but once established it will —given contact with the related protein or antigen— at any moment explode. The explosion takes the form of vascular endothelial poisoning, and as the same operates through the medium of local ischemia and venous stasis, it is not surprising that the clinical manifestations thereof should be extremely diverse. For, the symptoms will naturally vary with the regional distribution of the circulatory stasis, and the structure and function of the organ or tissue implicated.

If situated in a joint, it results in regular gout, if in the lung, asthma, if in the skin, urticaria, or eczematous eruptions, viz., irregular gout. Accordingly, if we accept cellular sensitization as the basal pathological change in gout, and that the same achieves its malign effects, through vascular endothelial poisoning, we seem to glimpse the inward meaning of the clinical mosaic presented by the regular and irregular manifestations of gout.

Incidentally, too, much of the mystery attaching to gouty metastases disappears, even the much maligned retrocedent gout becomes intelligible. Thus, if an acute gout in the toe suddenly abort, and alarming gastric symptoms as suddenly ensue, viz., intense abdominal pain, collapse, vomiting, sometimes of blood, may not these gastric symptoms be due to a local endothelial poisoning, a gastrostasis?

Conversely, in those authentic instances where an aphasia, an amnesia, or a hemiplegia, disappears with the onset of frank gout, may not the cerebral symptoms be due to temporary stasis in the related cortical vessels.

Again, may we not find herein a facile and no less a rational solution of those many recorded examples in which a fleeting erythemata or urticaria has, like a bout of asthma, vanished with the sudden outbreak of acute classical gout; or alternated therewith in that dramatic fashion so graphically portrayed by the older physicians, to whose masterly clinical insight, modern research ever brings increasing tribute.

Lastly, it seems to me that this conception of the etiology of gout opens up an encouraging vista for more efficient, and I would fain add, more scientific therapy. May not skin protein tests, if applied to the gouty, yield as rich a harvest of information as has already been gleaned in asthma? May not withdrawal of the offending protein, whether vegetable, animal, or bacterial, prove as prophylactic in the one as in the other? May not our sheet anchor—colchicine—even act as a desensitizer? But time and discretion alike forbid that I wander further in the regions of speculation.

May I then suggest the following points for discussion:

1. Gout is purely hereditary.
2. A tendency to cellular sensitization is the pathological groundwork of the disorder, viz., latent gout.
3. The gout is evoked by the corresponding protein or antigen, whether animal, vegetable, bacterial, or other.
4. It exerts its effects through the medium of vascular endothelial poisoning, with muscle tonus, especially of the bronchioles.
5. The same finds its clinical expression in the regular and socalled irregular manifestations of gout, viz., arthropathies, eczema, urticaria, asthma, etc.

Tuberculosis Among the North American Indians

Review of the Report of a Committee of the National Tuberculosis Association, Appointed on October 28, 1921

By S. ADOLPHUS KNOPF, M.D.,
New York.

To the average citizen of the United States the North American Indian is a vanishing race, and I am sorry to say that there are some men selfishly interested, claiming to be Americans, who wish for the disappearance of the Red Man. Let me however say to those who think that the North American Indian is doomed to disappear, that there are a number of Indian tribes now who are prosperous, increase in numbers, and constitute a desirable asset to our population. We know that there are quite a number of distinguished men and women who proudly trace their ancestry to some of our Indian tribes. One of them was my late, good friend and universally esteemed coworker, the late Dr. H. B. Favill, of Chicago. He was a most active and enthusiastic pioneer in the antituberculosis crusade and one of the prime movers and founders of the Chicago Tuberculosis Institute. He was deeply interested in the cause of the consumptive poor, a man of unusual professional ability, a gentleman and scholar, and to know him was to love him. Of fine features and of typical Indian stature, he made a striking appearance. Favill was of course also interested in the Indian problem and in the terrific death rate from tuberculosis existing at that time among many of the Indian tribes. But in the early days of the National Tuberculosis Association it was not strong and powerful as it is today and was obliged to concentrate its efforts mainly upon the prevention and treatment of the consumptive poor among the white population.

The prevalence of tuberculosis among our North American Indians, which in some tribes is increasing, has naturally been the concern for a number of years of all interested in this splendid race. After a number of state organizations, such as the Nebraska and Oklahoma associations, had interested themselves in the tuberculosis problem among the Indians, Dr. Kober, realizing that it was a problem concerning all the Indians of the United States, recommended the appointment of a committee by the National Association to study the problem thoroughly and make such recommendations as, with the cooperation of the United States Government, will better the existing conditions and, if possible, tend toward the eradication of tuberculosis among the Indian population. This committee was appointed October 28, 1921, and at the completion of its labors published their findings and recommendations.

HISTORICAL DATA.

Until the admirable report of this committee under the chairmanship of Dr. George M. Kober of Washington appeared no authentic information, covering all the Indian tribes on this subject, was available, and we owe a debt of gratitude to Dr. Kober and his coworkers for the careful study they gave to this important problem. The historical data, that is to say, the bibliographical researches on this subject, begin with a quotation from *Jesuit Relations* (Thwaite's edition, VI, p. 263) 1633. Among the interesting historical items relating to the subject is the mention of Benjamin Rush's work *Free Thoughts Upon the Cause and Cure of Pulmonary Consumption* (1794), in which he says: "Pulmonary consumption is unknown among the American Indians." However, J. D. Hunter, in the *American Medical Recorder* of 1823, modifies this assertion by saying: "I have known pulmonary consumption to occur among the Indians. It is rarely seen, however, except in those who are addicted to intemperance, and even in these it is by no means so common as among the whites."

PERSONAL OBSERVATIONS.

Very interesting are Dr. Kober's personal observations made during his army service from 1874 to 1894, when he came in contact with different Indian tribes. He was stationed at Camp McDermitt, Nev., from November, 1874, to July, 1877, where he observed the Paiutes. He subsequently came in contact with the Nez Perces, Spokane, and Klamath Indians, remaining with them until 1880, when again he came in touch with the Paiutes, near Fort Bidwell, in northeastern California. He does not recall a single case of pulmonary tuberculosis among them until after 1884, and then only among Indians who had exchanged their tepees for badly constructed and unsanitary dwellings. After this he observed cases of pulmonary tuberculosis among adult Indians, and also a case of tuberculous meningitis in a girl aged ten. It is Dr. Kober's belief that the Indians in Modoc County probably did not contract the disease from the white race, since during his entire practice, 1880-1894, covering 4,097 square miles, and with a population of about five thousand, he had only seen two cases of pulmonary tuberculosis among the settlers. As a matter of fact, the first white settler arrived after 1865. It had often occurred to him that the introduction of cattle by the whites may have played a rôle in the spread of the disease. In this connection it should be mentioned that between 1874-1877 the scarcity of food compelled the Indians near Camp McDermitt, Nev., to consume the flesh of domestic animals that had died. This same habit he found to exist among the Paiutes and Modocs in northern California from 1880-1894, and it appears to have prevailed elsewhere. While bovine tuberculosis is extremely rare among the range cattle of northern Oregon and California, it is not infrequent among milch cows.

The last item of historical interest mentioned is by Dr. Matthews who gave to the American Climatological Association, in 1888, the results of his twenty years observation in a dozen different states and territories and came to the following conclusions: "We have evidence that the wildest Indians in the earliest historic times were subject to consumption, yet they were not subject to it in a high degree, and it is probable that they suffered then from a different form of the malady to that which troubles the modern Indian. We have evidence that scrofula begins to prevail among them when they cease to live by chase, and that it (scrofula) is a condition predisposing to consumption among them."

INCREASED MORTALITY FROM TUBERCULOSIS AMONG INDIANS.

The records of later years, however, show an alarming increase in tuberculosis among the Indians. Thus we read in Col. Bushnell's latest book on *The Epidemiology of Tuberculosis*: "Several hundred Apache Indians (Chief Geronimo's Band), among whom were comprised some women and children, were confined at Mount Vernon Barracks, Ala., in 1887. According to the report of the Surgeon General for 1896, the death rate in the first year, 1887-88, was 54.64 per 1,000, and during the second year, 48.96, but it run up during the third and fourth years to 109.69 and 142.84, nearly one half of which was due to tuberculous disease. At this time great improvement was made in their condition; a new village was built for them, and they were placed under the most vigilant sanitary supervision, with the result of bringing the death rate in 1891-92 down to 109.75, the next year to 80.93, and in 1893-94 to 98.36. The prisoners were transferred to Fort Sill, Okla., in October, 1894, the excessive mortality that had prevailed among them in Alabama being one of the chief reasons for effecting the transfer. Here they were asisgned land and led a free life. At the end of the first year at Fort Sill it is reported that their condition was much improved, but that the death rate continued high, 83.05 per 1,000; yet it was thought that a large part of the mortality was referable to infection at Mount Vernon Barracks. Of the total of twenty-five deaths, seventeen were due to tuberculous disease. Glandular affections were common among these Indians, but the deaths were chiefly due to pulmonary tuberculosis."

MORTALITY RATE AMONG INDIANS IN THE UNITED STATES ARMY.

The report then describes the mortality rate among the Indians in the U. S. Army, which concludes with the significant statement that the rates of admission, discharges and deaths of Indians from pulmonary tuberculosis are enormously greater than those of the other troops. Most striking is Dr. Matthew's conclusion concerning the Cherokees, in which he says: "In view of all the evidence now before us, we may declare that some of the highest rates of mortality from consumption and other tuberculous diseases among Indians are found in communities which have been longest in contact with civilization."

May I be permitted to add here that this increased death rate is not because of contact with the best environments which civilization has created, but with the worst, otherwise the socalled susceptibility of the Indian and the colored race as well might well be considered a negligible matter. The committee arrived at almost the same conclusions when it makes the following statement: "Those of us who have seen the Indians in the wild state, and admired their splendid physique and wonderful power of endurance, can not believe that such a race is destined to become extinct by reason of a peculiar susceptibility to tuberculosis. While it is true that the Indians, like the African race, have shown a nonresistance to the disease producing causes which are afloat, the real cause is not inherent but due to the fact that they have been the victims of most unfavorable environments in the transition stage of their civilization."

Dr. Kober's vast experience in dealing with the tuberculosis problem among the Negroes of the District of Columbia also shows that pure water and air, condemnation of dwellings unfit for human habitation, the erection of sanitary homes at reasonable rental, pure food laws with special reference to milk, registration of tuberculous cases, and care and treatment in suitable hospitals, legislation and education for the prevention of contact infection, infant and child welfare work, better economic conditions, and a more plentiful and suitable supply of food, were responsible for the reduction of the general death rate among the Negroes of Washington, D. C., from 1,102 per 100,000 in 1875 to 265 in 1921.

CAUSES OF INCREASED PREVALENCE OF TUBERCULOSIS AMONG INDIANS.

Surveys by special investigation commissions in 1904 and a survey conducted by the U. S. Public Health Service in 1912 in the twenty-two States which have Indian reservations, are reported and the following conclusions arrived at: The main cause of the increasing prevalence of tuberculosis among the Indians may be ascribed to overcrowding. There is a high birth rate among the Indians. It is no unusual sight to see eight or ten individuals living in one small dwelling, or for Indian families to huddle together, even in commodious quarters.

It would lead too far in this review to reproduce the 178 interesting answers which were received from Federal agencies and from thirty-nine State agencies of the Bureau of Indian affairs. The questions asked were the following:

1. Have you statistics which indicate an increase or decrease in the spread of tuberculosis among the Indians?

2. What, in your opinion, are the most prominent predisposing causes in the spread of tuberculosis among the Indians?

3. What methods have been adopted by the Federal and State authorities and State and local tuberculosis associations to diminish the spread of the disease among the Indians?

4. What remedial action would you recommend for the alleviation of existing conditions?

From the conclusions of the inquiry, I will only quote the most striking ones: "Scrofula and consumption were observed among the Indians of North America as early as 1635. . . . No bones of undoubtedly pre-Columbian origin have been found that show tuberculous lesions, and such lesions are very rare in Indian bones, dating from the period of the earliest contact with the whites. . . . From the available data, it is also evident that there has been a progressive increase in the prevalence of the disease since their contact with the whites. . . . Some tribes were thoroughly tubercularized, while others showed the characteristics of a recent acquaintance with the disease in its high fatality. In most of the Indian tribes it would probably be correct to say that tubercularization was progressing but was as yet not complete. . . . In view of these facts and in the light of our knowledge concerning the influence of environments, food, and economic conditions on the rise and fall of tuberculosis in some of the Indian tribes and among the American Negroes, some observers hesitate to accept the conclusion that the American Indian was especially susceptible because of a lack of previous exposure. Those who are familiar with the tuberculosis movement, especially in the Central European states during the World War, are deeply impressed with the fact that lack of food both in quantity and quality, worry, anxiety, chronic fatigue, and undermined health are important factors in the reactivation and ravages of the disease. In the consideration of the question of susceptibility of the Indian to tuberculosis, we should bear in mind that the advent of the white race was promptly followed by a struggle for existence and subsistence. One of the baneful effects among the inland Indians was a gradual destruction and dispersion of their game and other natural sources of food supply, causing extreme suffering and a state of semistarvation."

RECOMMENDATIONS OF COMMITTEE.

Among the recommendations which the committee offers as the result of its labors, are primarily of course sanatoria where the adult Indian in the last stage of tuberculosis can finish his days without jeopardizing the lives of those to whose care he is committed. Public health nurses to instruct in the care of the sick and in the prevention of the disease, and prenatal and infant welfare work. A better compensation for all fulltime salaried medical officers, teachers and employees in the Indian service, sanitary inspection and the removal of all unsanitary conditions, proper supervision of the food and water supplies, and a well balanced diet in the institutions and homes. The pasteurization or simple scalding of the milk for all classes, but especially for infants and children is strongly urged, as well as the introduction of milch goats. Better cooperation and understanding of Federal and State governments relating to Indian affairs is strongly recommended. The constant employment of the Indians, most of whom are industrious and willing to work, is urged. The committee is convinced that the Bureau of Indian Affairs is in no way disposed to pauperize our Indians, and certainly should be intrusted with sufficient funds for immediate relief of distress.

State boards of health are urged to enact laws to suppress vice and the mescal button (peyote habit), even for sacramental purposes. Peyote or pellote, (the Lophophora williamsii) and the mescal, (the Agava americana) both are strong narcotic drugs, not interdicted by the national prohibition amendment.

The report concludes with an urgent plea for cooperation with State and local antituberculosis organizations and educational and social societies, but very pertinently closes with the following significant statement: "No amount of health education will suffice to secure definite and lasting results until we improve their (the Indians') economic conditions and give them a chance to work and earn an honest living. When we extend a helping hand and evince a truly sympathetic interest in their welfare, and do as much uplifting work as we are disposed to do for our alien residents and among far away pagan races, we will have only in part discharged our obligations to the native race that has suffered so much and to whom we are so deeply indebted for possessing the immense natural resources of their native land."

INDIANS IDEAL TUBERCULOSIS PATIENTS.

Here I wish to say something in favor of the Indians afflicted with tuberculosis which perhaps is not generally recognized, and though it is only based upon the comparatively few observations which I have been able to make in the treatment of tuberculous Indians, I believe it to be significant. The Indian it seems to me is an ideal tuberculous patient by reason of his wonderful control of his nerves. The neurotic element, the restlessness and discontent which is found in so many tuberculous patients in the white race, is virtually absent in the Indian. He is a stoic and when properly reasoned with he will be an ideal patient and carry out the rest cure with an almost religious punctuality. Thus, if sanatoria for the Indians are placed as closely as possible to their former places of habitation, so that nostalgia does not enter as a complication, the percentage of cure in the early cases among Indians would, I am sure, be as high if not higher than among the tuberculous coming from the white race.

OFFICIAL REPORTS OF INDIAN MEDICAL SERVICE.

The remainder of this report of over one hundred pages furnishes numerous interesting tables and copies of official reports of the Indian Service, and lastly, as an appendix, gives an interesting historical sketch of the U. S. Indian Medical Service, which concludes with the very gratifying report of the present status as compared with thirty-five years ago. In 1888 the service had only four hospitals, in 1922 it had seventy-three, and during the World War and up to 1921, their number varied from eighty-one to eighty-five, although the medical personnel in the service in 1895 consisted of seventy-four physicians, eight nurses, seven hospital employees, and three field matrons, the personnel is now increased to two hundred physicians, one hundred nurses, one hundred hospital employees, and seventy-five matrons.

The report is signed by George M. Kober, M. D., LL.D., Chairman; George E. Bushnell, M. D., Joseph A. Murphy, M. D.; Albert B. Tonkin, M D.; William H. Baldwin, and Hoyt E. Dearholt, M. D., and is and will be a long time considered a classic document on the tuberculosis situation among the North American Indians. Its careful study should give food for thought, not only to the physician interested in the tuberculosis problem, but also to every American patriot, and above all to our American statesmen. Every one studying this report must realize that we have been found wanting in our duties toward the one hundred per cent. Americans and while much has been done for them during the past twenty-five years in improving their condition much more should be done.

16 WEST NINETY-FIFTH STREET.

Coexisting Intrauterine and Extrauterine Gestation

By JOHN M. KEYES, M.D.,
New York.

In an article on ectopic gestation from the viewpoint of clinical experience (1), published in 1910, I presented a detailed study of thirteen cases and mentioned among the complications the possibility of an intrauterine pregnancy occurring simultaneously with an extrauterine one. The following year I discussed in another article (2) three phases of ectopic gestation, considering the relative frequency of their occurrence, the mortality and the complications. In this second article I reported eight cases in detail and I pointed out that with certain known complications in mind and the proper surgical disposition of them, the mortality index could be kept low. Such cases as have come under my observation between the date of my last article and the appearance of the case I am about to report, have followed more or less orthodox courses.

On July 6, 1922, the following interesting case was referred to me by Dr. J. J. Kumpf, of this city:

CASE.—Mrs. C. R., aged twenty-nine years, was the mother of two children, the youngest twenty-two months of age. The patient had measles and diphtheria in childhood. Except for an occasional cold she had been in excellent health. She was well fed, plump, and robust in appearance. She first menstruated when fourteen years of age, was the twenty-eight day type and flowed, without pain, three or four days. The previous May the flow had come on and had continued one day on and one day off for one week. In June she flowed for one week and then had an active hemorrhage accompanied by cramplike pains, which she described as like those when she had a baby. She said she also had evening nausea, that being the type of nausea from which she had suffered during her earlier pregnancies. Vaginal examination revealed purplish mottling at the outlet, an enlarged uterus, and a mass to the right of it, tense, tender and fluid. Also some boggy thickness was found to be present in the posterior *cul-de-sac*.

The case was tentatively diagnosed as right tubal pregnancy and the patient sent to the hospital, where I operated on her within a few hours. Ether was administered by Dr. McNaughton. Assisted by the family physician, Dr. J. J. Kumpf, I first did a curettage, according to my custom. When the uterus was dilated there was an active hemorrhage and while the curette showed mostly decidual scrapings, a few shreds were suggestive of placental tissue. After a brisk curettage the hemorrhage stopped and as the patient had a very fat abdomen and as I was loath to put much pressure on it to manipulate the uterus, I decided to go ahead with the laparotomy, voicing to my associates the suspicion of the existence of an intrauterine gestation. Laparotomy revealed a uterus slightly tilted to the left just rising out of the pelvis and looking decidedly like one three months pregnant. I removed the right tube and ovary and also the thickened and kinked appendix. The left tube and ovary were normal. There was a fair amount of free blood and clots in the abdominal cavity. I closed the abdomen without drainage.

Postoperatively, a moderate bloody vaginal discharge and nausea continued for three days; otherwise the case was normal. On the fourth day the temperature rose to 102° and a fairly active hemorrhage with clots took place. The nurse reported finding fetal bones among the clots. On the following day, with the patient in dorsal decubitis position and without anesthesia, I removed a placental mass that was presenting at the cervix. I swabbed the uterine cavity with iodine and packed it with gauze. After this the nausea stopped and the patient had an uneventful recovery and was discharged two weeks from the date of admission.

Laboratory findings, by George L. Rohdenburg, for the Dr. Albert M. Pasca Laboratory, were as follows:

"Microscopic examination of specimen a shows a blood clot in which there are numerous chorionic villi, all in a good state of preservation. Specimen b shows an appendix in which the mucosa is intact and normal though the submucosa is thickened and richly infiltrated with round cells. The lymphoid elements of the organ show a marked hyperplasia. The muscular coats show no changes, the serous coat shows a recent inflammatory change characterized by a moderate proliferation with infiltration with round cells and a few polymorphonuclear leucocytes. Specimen c shows a connective tissue wall which is edematous and in which there are many round cells of irregular shape; in the latter there are many pigment deposits of brown, granular appearance. This pigment gives the Prussian blue reaction and is therefore iron. Internal to this connective tissue wall there is a blood clot which is undergoing organization, there being many connective tissue fibrils and newly formed bloodvessels extending from the connective tissue wall. Specimen d shows a Fallopian tube in which the wall is much thinned and in which there is extensive hemorrhage. None but the muscular and serous coats is identifiable. The mucosa is destroyed and replaced by a blood clot which is poorly organized and in which there are chorionic villi, some in a fair state of preservation, others appearing only as shadows. The ovary shows a slight fibrosis with a recent corpus luteum which is well organized. There are several simple follicle cysts of varying size scattered throughout the section.

"Diagnosis: Chronic productive appendicitis and periappendicitis with ectopic gestation."

"(Signed) G. L. ROHDENBURG."

My excuse for reporting a single case is that it is not the lot of every operator to come into contact with this condition and every individual experience of this kind is worthy of comment. Formad reports thirty-five ectopic pregnancies in 3,500 general autopsies. Edward Armin Schuman reports the incidence of tubal pregnancy to normal pregnancy for the city of Philadelphia, 1918, as .0033 per cent. The incidence of coexisting intrauterine and extrauterine pregnancy to tubal pregnancy is small. F. F. Simpson (3) reports 113 collected cases of coexisting intrauterine and extrauterine pregnancies with a maternal mortality of thirty-four. Parry, 1876, reported twenty-two cases among 499 ectopics, that is, 0.0441 per cent.

Formad's report shows ectopic pregnancy as a factor in one out of one hundred cases and the general experience of students of this condition is that during the childbearing period it is a comparatively common occurrence. It stands to reason, then, that the coexisting intrauterine and extrauterine pregnancies are somewhat more frequent than was formerly believed.

In my article on Three Phases of Ectopic Gestation (2), I pointed out that a chronic appendicitis with adhesions and a right tubal pregnancy were likely to coexist, the adhesions acting as a causative factor in tubal pregnancy by sacculating or kinking an otherwise normal tube. We had such a condition in this case. In the same article I drew attention to the fact that the proper disposition of complications tended to lessen mortality. The figures in Simpson's tabulated report show a maternal mortality of thirty-four in 113 cases. In this case of mine the suspicion aroused at operation tended to the easy and successful handling of the complication. My routine in ectopic pregnancies has been to do a preliminary curettage both for the purpose of arresting hemorrhage and also to render the uterine cavity sterile, but my experience with this case will prompt me to leave the uterus to deal with the decidua if that alone is what it has to deal with.

A number of these cases of double pregnancy are reported where the ectopic ones spontaneously took care of themselves or were removed by laparotomy while the uterine ones went on to term with a viable child. In going over the literature of coexisting intrauterine and extrauterine gestation I was struck with the fact that a great many cases were reported as interstitial and intrauterine pregnancies. That stimulated one's imagination to regard the mechanical factor as a causative agent in the distribution of these double pregnancies.

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640 Madison Avenue.

Further Experiences with Peptic Ulcers Accompanied by Deformities of the Viscus Visible by X Rays*

By MAX EINHORN, M.D.,
New York.

Last year I published a paper (1) reporting cases of peptic ulcers with deformities of the viscus evidenced by x rays, treated from April 1, 1921, to April 1, 1922. It was shown that these far advanced cases of peptic ulcer with niche formation along the lesser curvature and deformity of the cap are amenable to medical treatment. The same view is held by Hamburger (2) and Diamond (3), as cited in my article. H. Ohnell has likewise written extensively on this subject. At the time I published my paper I was not aware of his work, and I wish here to compliment his meritorious pioneer work in this line. Ohnell (4) reported six cases of gastric ulcers with niches which he cured by medical treatment. In order to be successful, he considers abstinence from food by mouth for a number of days, followed by a light diet (Leube) as essential. In a later paper (5), the same eminent clinician published his experiences with thirty-six cases of ulcers with niches. In ninety-two per cent. of these, perfect cures—that is, disappearance of the niches—were accomplished.

Notwithstanding the papers just mentioned and a few others expressing the same opinion, the question of the curability of peptic ulcers with niches is still doubted by a great many clinicians and by almost all surgeons. For this reason it does not appear inappropriate to publish so soon my further experiences with these cases. Before discussing the new material, however, I should like to review the condition of the patients described in my last year's paper. I regret that I cannot give an account of all of them, but shall state the progress of as many as I am aware of.

Of the six cases of ulcer with niche formations I know the condition of five. In case I (L. K., as described in my paper) the patient has gained about thirty pounds, eats everything, has no symptoms whatever, and attends to his business. In case II (Andrew R.), the patient who had the largest niche and was almost beyond help, feels perfectly well, and up to January 5, 1923, had gained over thirty pounds in weight and eats everything. In case III (Harry A.) is also in good condition and has gained in weight. The patient in case IV (Solomon D.) was well up to November, 1922, when he began to be troubled with upper abdominal pains, principally in the right hypochondrium. He was sent to the hospital for investigation. All the examinations, including x ray pictures, showed that there was no ulcer present—especially was there no reappearance of any defect or bulging out of the mucosa at the place where the niche had existed. It was found, however, that he had some gallbladder lesion to which his recent complaint was due. In case VI (John E. McC.) the patient improved considerably and gained in weight, but was advised by me to be operated upon on account of duodenal adhesions and gallbladder trouble. This was done and the patient is now perfectly well.

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*Read before the New Mexico State Medical Society on June 20, 1923, Albuquerque, N. M.

Of the cases with duodenal ulcers described, four patients are in good condition, while I have not been able to follow the others.

In the present paper I wish to describe briefly the new cases of ulcers with deformities of the stomach or duodenum which I have observed in the year from April, 1922, to April, 1923. Five of these cases were affected with gastric ulcers and eight had ulcers of the duodenum. Some of these had partial obstruction of the pylorus also (Schneck and Henry M.). Two of the cases with niche formations I shall briefly describe while the others will be grouped in table form.

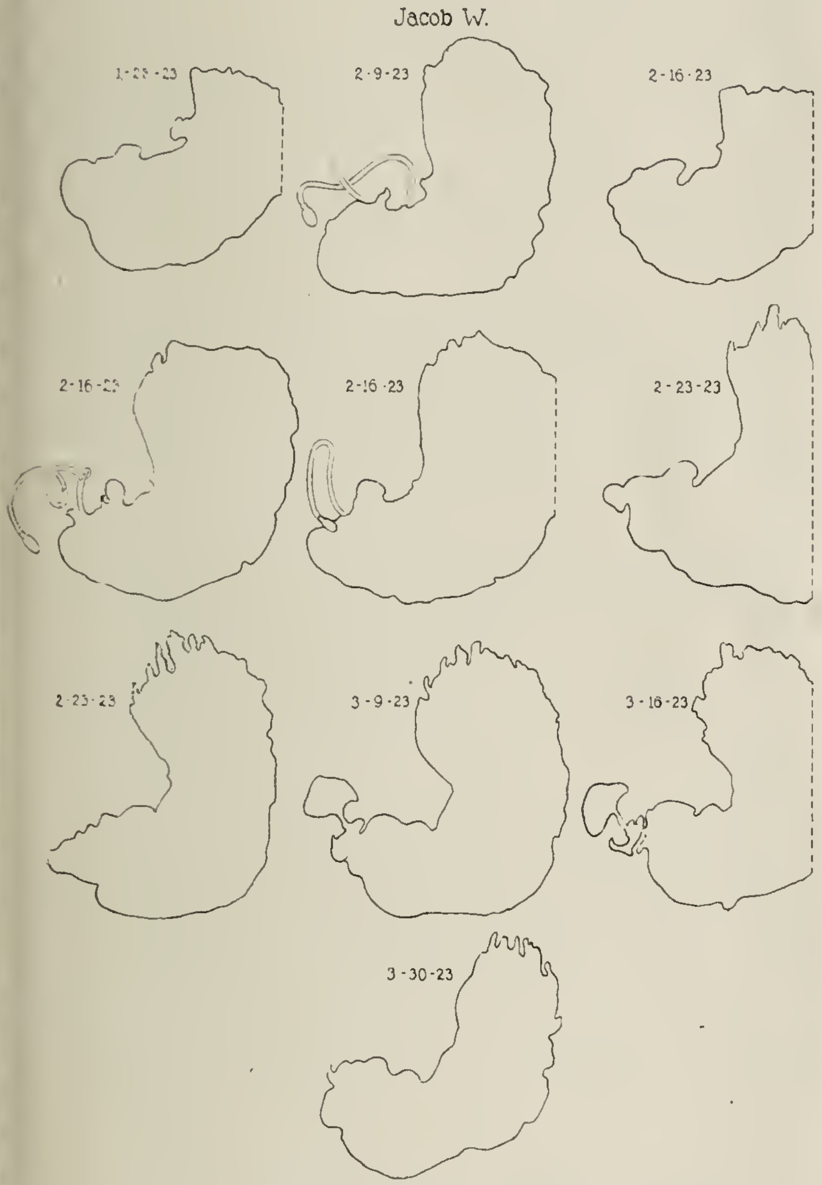


Fig. 1.—Case I. Jacob W. a, before treatment, January 23, 1923. Erect: niche of considerable size visible on lesser curvature. b, two weeks after treatment, February 9, 1923. Prone: niche has diminished to about one third its original size. c, three weeks after beginning of treatment, February 16, 1923. Erect: niche has diminished to about one sixth its original size. d, February 16, 1923. Same: oblique, niche more distinct. e, February 16, 1923. Same: prone. f. One week after removal of tube or four weeks after beginning treatment, February 23, 1923. Oblique: niche has diminished to about one tenth its original size. g, February 23, 1923. Same: prone, niche hardly noticeable. h, March 9, 1923. Six weeks after beginning treatment. Oblique: hardly a trace of niche visible. i, March 16, 1923. Oblique: hardly anything noticeable. j, March 30, 1923. Nine weeks after beginning treatment. Oblique: perfectly normal; not a trace of niche noticeable.

Case I.—Jacob W., a widower, forty-four years of age, a laborer, born in Hungary. He was admitted to the hospital in January, 1923, with a diagnosis of penetrating ulcer of the stomach. His family history was negative. Five years previously he had a chancre and was treated for five weeks. Four years ago he had an attack of gastric trouble

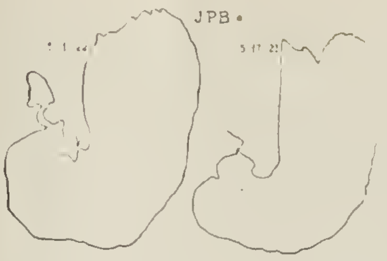


Fig. 2.

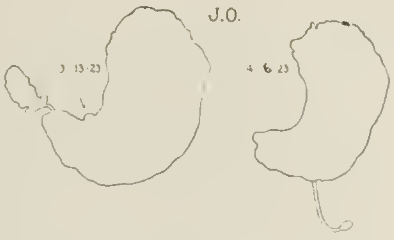


Fig. 3.

Fig. 2.—J. P. B. (Case I, table). a, May 1, 1922, before treatment. Niche on lesser curvature visible. b, May 17, 1922, after treatment. Niche has disappeared.

Fig. 3.—J. H. O. (Case II, table). a, March 13, 1923, before treatment. Oblique: Niche of considerable size on lesser curvature. b, April 6, 1923, after treatment. Oblique: Niche has entirely disappeared.

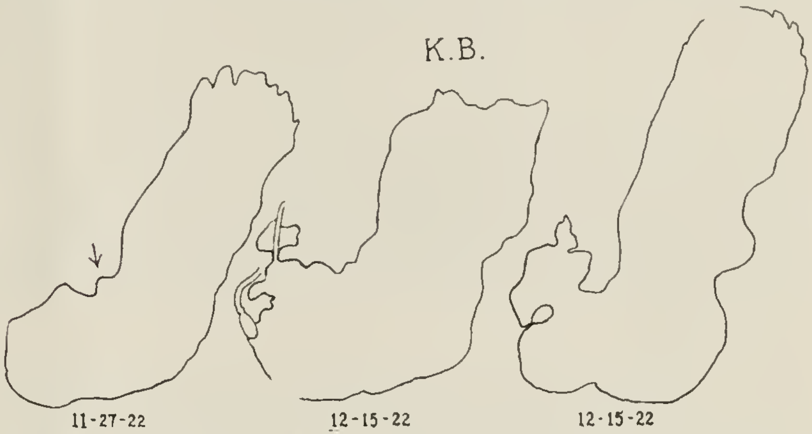
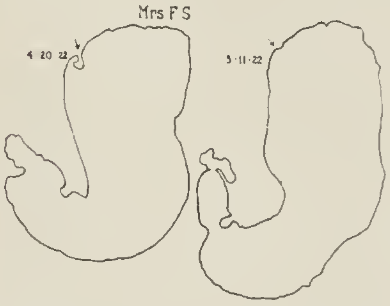


Fig. 4.—Karl B. (Case II, text). a, November 27, 1922, before treatment. Medium size niche visible on lesser curvature. b, December 15, 1922, after treatment. Tubes visible in duodenum. Niche has almost disappeared. c, December 15, 1922. Same, erect; not a trace of niche noticeable.



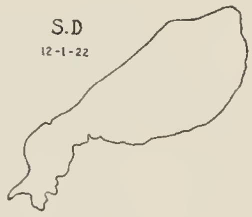
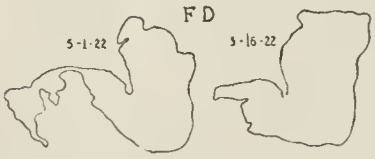


Fig. 5. Fig. 6.

Fig. 5.—Mrs. F. S. (Case III, table), a, April 20, 1923, before treatment. Defect in cardiac portion of stomach visible. b, May 11, 1923, after treatment. Defect has disappeared.

Fig. 6.—Solomon D. December 1, 1922. Re-examination of patient—reported in last year's paper and mentioned in text of present article—shows no return of the niche.



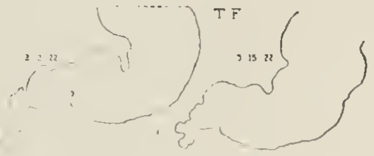


Fig. 7. Fig. 8.

Fig. 7.—Frank D. (Case IV, table). a, May 1, 1922, before treatment. Considerable defect in pyloric portion. b, May 16, 1922, after treatment. Defect has almost disappeared.

Fig. 8.—Timothy F. (Case V, table). a, February 2, 1922, before treatment. Deformed, lengthened and rigid pylorus. b, May 15, 1922, after treatment. The deformity is less marked.

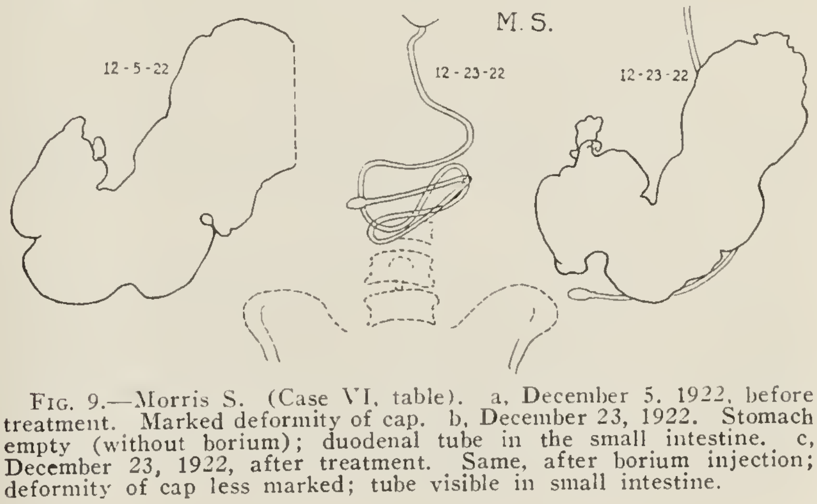


Fig. 9.—Morris S. (Case VI, table). a, December 5, 1922, before treatment. Marked deformity of cap. b, December 23, 1922. Stomach empty (without borium); duodenal tube in the small intestine. c, December 23, 1922, after treatment. Same, after borium injection; deformity of cap less marked; tube visible in small intestine.

similar to that for which he was admitted, which lasted for seven weeks.

The onset of the last attack occurred in October, with sudden severe pain in the epigastrium. This pain persisted on and off to the time he was admitted to the hospital. The pain was located in the epigastrium, radiating to the chest, and came on one or two hours after meals. The ingestion of food slightly relieved the pain, which was worse at night. During the first three weeks of the attack the patient suffered from persistent vomiting after each meal. This subsided after dietetic treatment in a hospital.

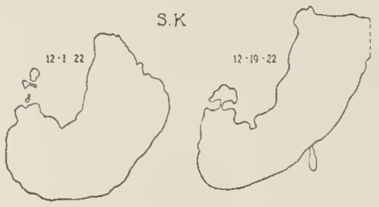


Fig. 10.

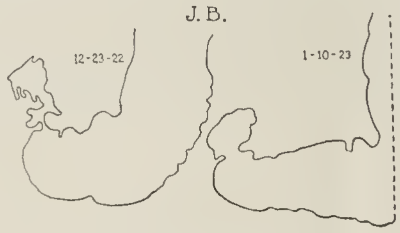


Fig. 11.

Fig. 10.—Siegmund K. (Case VII, table). a, December 1, 1922, before treatment. Marked deformity of cap, with contraction of lumen. b, December 19, 1922, after treatment. Cap less deformed, almost normal; capsule end of tube visible in beginning of jejunum.

Fig. 11.—Jacob B. (Case VIII, table). a, December 23, 1922, before treatment. Persistent defect in the first portion of the duodenum. b, January 10, 1923, after treatment. Defect has disappeared; cap almost normal.

The patient had suffered from diarrhea for the week previous to admission, having five to six movements daily, and had lost forty pounds in weight in two months.

The physical examination showed the skin to be dry and scaly; the pupils unequal; the teeth infected —pyorrhea; the lungs dull all over; the heart slightly dilated to the right; and tenderness in the epigastrium. Temperature 102° F. on admission, but subsided in three days and was normal ever since. The Wassermann test was negative, as was also the string test. The gastric contents showed: Hydrochloric acid+50; acidity=60. Blood examination negative. The x ray pictures showed a big niche in the lesser curvature.

The patient was put on duodenal feeding for twenty-one days, at the end of which time he had no pain and had gained nineteen pounds in weight. He was discharged February 24, 1923.

During the duodenal feeding period, at the end of two weeks, the first control x ray picture of the stomach was taken. At the end of three weeks the tube was removed and another x ray picture of the stomach was taken, after which the patient was allowed a more liberal diet. An x ray picture was then taken every week, the gradual diminution of the niche being distinctly seen. On March 16, 1923, the patient reported that he had gained twenty-nine pounds since the treatment.

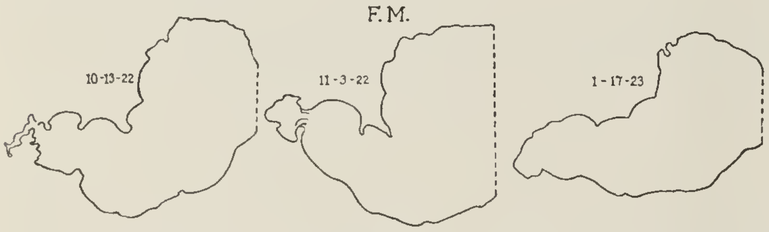


Fig. 12.—Fred M. (Case IX, table). a, October 13, 1922, before treatment. Marked irregularities in the prepyloric region, and deformity of cap. b, November 3, 1922, after treatment. The irregularities have disappeared and the deformity of cap has become less marked. c, January 17, 1923. The pyloric portion has assumed a more normal appearance.

Case II.—Karl B., fifty years old, was admitted to the hospital December 23, 1923, with a history of epigastric pain and vomiting for five years.

The patient began to complain five years ago of pain in the umbilical region, coming on three to four hours after eating, and was accompanied occasionally by vomiting. He had had ten severe attacks of this pain and vomiting within the past five years. Three weeks before admission the pain shifted to the epigastrium, and he suffered from severe vomiting three to four hours after meals. He had always been constipated, and had lost fifteen pounds in the last five years. There was no blood in the stools, and no blood in the vomitus. The physical examination showed the stomach dilated, extending to the symphysis (splashing sound). The gastric contents showed: Hydrochloric acid+acidity=50. There was no blood noted. The string test showed no blood stain; but there was bile present on it from twenty-four inches to the end. The x ray picture showed a niche on the lesser curvature, and six hour gastric retention.

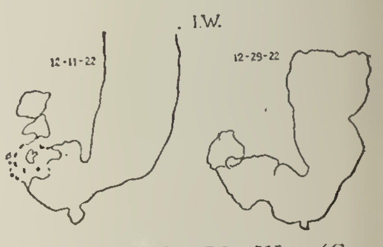


Fig. 13.—Miss Ida W. (Case X, table). a, December 11, 1922, before treatment. Sacculation in second portion of the duodenum, and defect in prepyloric portion. b, December 29, 1922, after treatment. Defect and sacculation have entirely disappeared.

This case is of interest in showing that the niche entirely disappeared in the short period of two weeks, under treatment by duodenal alimentation. In a letter from the patient under date of March 20, 1923, he states that he is feeling perfectly well, is eating a liberal diet, and is attending to his work as a chauffeur.

The rest of the cases are presented in the table on page 615.

Inasmuch as the reproduction of the x ray photographs is not always satisfactory when published, I prefer to give sketches made by an artist from the photographs taken in all these cases. They were all taken at the Lenox Hill Hospital and I, herewith, express my thanks to Dr. W. H. Stewart, the head of the department for röntgenology. The result of treatment, which was always duodenal alimentation, was very gratifying. In one of the patients (Henry M.) the pylorus was partially stenosed and the tube did not pass the outlet during a period of five days. I was inclined to have the patient undergo an operation (gastroenterostomy) but on account of his age (sixty-seven years) and his condition (he was suf-

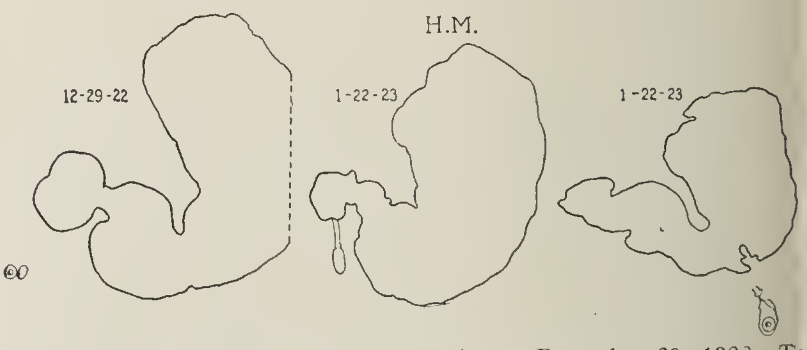


Fig. 14.—Henry M. (Case XI, table). a, December 29, 1922. To the right of the stomach two beads are visible, indicating that the digestive test capsule or beads have passed through the narrowed pylorus. b, January 22, 1923. The capsule end of the duodenal tube is visible in the duodenum. c, January 22, 1923. The bead attachment of the duodenal tube is seen in the beginning portion of the jejunum.

TABLE OF THE REMAINING CASES OF PEPTIC ULCER WITH DEFORMITIES OF THE VISCUS VISIBLE BY X RAYS TREATED FROM APRIL 1, 1922 TO APRIL 1, 1923.

No.	*Name*	*Symptoms*	*Physical Signs*	*String Test*	*Gastric Contents*	*X-Ray*	*Results*
1.	J. P. B...	Pains immediately after meals, duration 20 years. Occasionally vomits but no blood. Had an attack of hämatemesis 21 years ago. Has lost 20 pounds past 4 months.	Tenderness on pressure, stomach considerably dilated.	Positive; blood stain, 53-55 c. m.	HCl=+; Ac.=85.	Penetrating ulcer of lesser curvature, 6 hour gastric residue.	Niche disappeared, patient feels very well.
2.	J. H. O...	Past 2 years, nausea and vomiting; epigastric pains late after meals; food relieves pain.	Pains on pressure in left epigastrium, radiating to the back.	Positive; blood stain, 61-62 c. m.	HCl=+; Ac.=50; blood=+;	Penetrating ulcer of lesser curvature.	Niche has entirely disappeared; patient feels well.
3.	F. S......	Pain and burning in epigastrium for 15 years.	Tenderness on pressure right beneath the ensiform process.	Positive; blood stain, 35-50 c. m.	HCl=+; Ac.=90.	Irregular defect on the lesser curvature, high up at the cardia; slight gastric residue after 6 hours.	Defect disappeared; patient feels better.
4.	F. D.......	Lues 20 years ago; past 7 years pains after meals; melaena and hämatemesis; Wassermann++++	Tenderness on pressure under right costal margin.	Positive; blood stain, 43-56.	HCl=+; Ac.=85.	Defect on the greater curvature of the stomach in the prepyloric area; the cap is deformed; slight 6-hour gastric retention.	Defect has decreased; patient eats and feels well.
5.	T. F......	Discomfort in epigastrium for 6 years, no relation to food; hämatemesis and melaena once. Wassermann neg.	Pains on pressure beneath the ensiform cartilage.	Positive; blood stain, 55-57 c. m.	HCl=+; Ac.=112.	Duodenal ulcer with deformity of pylorus.	The deformity is less marked; patient feels well.
6.	M. P......	Past 12 years has had pain on and off in right hypochondriac region 2-3 hours after meals pain was relieved by eating; Wassermann=neg.	Liver enlarged. Pains on pressure in right hypochondrium stomach dilated and extending a hand's width below the navel.	Positive; blood stain, 50 c. m.	HCl=+; Ac.=40. Blood=neg. (feces neg. for blood.)	Deformity of cap in all films; slight 6-hour gastric retention.	Deformity lessened; patient feels well.
7.	S. K......	Vomiting on and off past 2 years; headaches one year; pain in right hypochondrium 3 weeks. Wassermann neg.	Tenderness on pressure in right hypochondrium.	Positive; double blood stain, as 56½ c. m.	HCl=0; Ac.=10. Lactic Acid =0. Blood =neg.	Cap contracted; considerable 6-hour gastric retention.	Deformity of cap less marked; patient feels better.
8.	J. B......	Duration 9 years with periods on and off lasting several weeks of epigastric distress one and one-half hours after meals; relieved by bicarbonate of soda. During the last 5 years there was also vomiting during the attacks.	Pain on pressure in the middle of the epigastrium.		HCl=82; Ac.=98; Blood=neg.	Persistent defect in the first portion of the duodenum.	Deformity and defect of cap have disappeared; patient feels better; has gained 30 pounds in weight; eats a liberal diet.
9.	F. W. M..	Duration 8 years; heartburn 3-4 hours after meals coming on in periods lasting several weeks, with few intermissions.	Tenderness in the entire epigastrium; stomach dilated extending 3 fingers' width below the navel.	Positive; blood stain, 42-52 c. m.	HCl=+; Ac.=70; Blood=neg.	Marked irregularities in the prepyloric region, suggesting ulceration with spasm.	Deformity of cap less marked; patient eats and feels well.
10.	Miss I. W.	Duration 13 months; epigastric distress, belching of gas, nausea right after eating.	Pain on pressure under right costal margin.	Positive; blood stain, 41-43 c. m.	HCl=+; Ac.=72; Blood=—	Peculiar sacculation in ascending portion of the duodenum just beyond its junction with the bulbus. Such finding usually indicate a diverticulum; slight 6 hour gastric retention and considerable retention in the diverticulum. (Dr. W. H. Stewart.)	Diverticulum has disappeared; patient feels well.
11.	H. M.....	Duration 10 years, epigastric distress on and off during this period. Diabetes mellitus for a number of years.	Tenderness on pressure in right hypochondrium, stomach dilated extending to the symphysis.	Positive; blood stain, 48-52.	HCl=+; Trace. Digestive test capsule appears after 50 hours; remaining some thymus (no nuclei).	Distinct pressure defect on the duodenum, suggesting some involveder.	Cap fills out better.

fering from diabetes mellitus), and also because he was strongly opposed to operation, I decided to make further efforts at medical treatment.

I attached a bead with a string to the capsule of the duodenal tube and had the patient swallow this contrivance. The bead being much smaller than the capsule, passed through the narrowed pylorus in twenty-four hours, and in another twenty-four hours pulled the capsule into the duodenum, and made the duodenal alimentation feasible.

While at first I thought that the disappearance of the niche was a mere possibility, I am now of the opinion that this is rather the rule, provided efficient treatment is instituted. It is, therefore, evident that these old peptic ulcers with deformities do not as such form an indication for surgery, for they can be healed. It is understood, of course, that there may at times be urgent reasons for intervention and that surgery may have to be resorted to, but in my opinion most cases can be healed by proper medical treatment.

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Comparative Blood Studies in Smallpox and Chickenpox*.

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For several years in many parts of America epidemics of smallpox have been observed, which by their mild character were so essentially different from all former varieties, that there have been serious doubts about the question, if the disease really is identical with smallpox, or if perhaps a new disease is presenting itself similar to the one known as alastrim in Jamaica. I think, however, the opinion has been confirmed among sanitarians that the epidemics were undoubtedly true smallpox, though unusually mild in character. I may mention that in Cuba I have seen a certain number of cases generally considered as alastrim, which also must be attributed to true smallpox.

Also in Cuba the epidemic presented itself in such a mild form, that there were almost no fatal cases with the exception of a few in persons seriously debilitated by other diseases. At present, it seems that the epidemic has come to an end here, owing to the serious campaign undertaken against it from the beginning. The studies which I made were suggested by Dr. Guiteras in the desire to devise simple and rapid diagnostic methods in his campaign.

In the Las Animas Hospital I had occasion to see the cases which occurred in Havana or which were transferred here from the province during the last three years, and was able to study them with different laboratory methods. The results of my experiences, especially the inoculations made in the cornea of the rabbit, have also given me the conviction, that the disease was true smallpox[1]. At the same time there occurred many cases of varicella, which have been studied under the same conditions. It was always possible to differentiate the two diseases with absolute certainty.

During my studies I have made comparative investigations in the blood composition in the sixty cases of smallpox and forty cases of chickenpox here reported. In all the cases I made regular daily leucocyte counts and differential counts for forty days in smallpox and twenty days in chickenpox. The blood is by no means normal after those periods, but the observations could not be continued because the patients were discharged from the hospital.

In my opinion the results are of practical value, as they give a simple and reliable method, which may be used for clinical purposes and especially for the sanitarian to make an early and rapid diagnosis in doubtful or suspicious cases.

In many cases I made studies of the red cells and the hemoglobin content of the blood. Although I generally found slight degenerative changes, especially in smallpox, I should not attribute a great practical diagnostic importance to those findings, because blood degenerations are so frequent from other causes, especially in the tropics, that is scarcely possible to use them in the diagnosis of smallpox.

The study of the blood changes is so easy, that it should be omitted in no case in such an important and contagious disease as smallpox, the control of which depends so completely on early and efficacious sanitary measures. The results of the leucocyte counts, derived from my observations, are the following:

SMALLPOX.

The number of leucocytes is generally low in the first three days of the disease, about 4,000-6,000, with an average of 5,000. From the fourth day there will begin a marked increase of leucocytes, which reaches its highest values on the ninth day, with an average of 17,000, and which continues to the fourteenth day with a pronounced remission about the tenth to twelfth day. During this period it is not rare to find 24,000 to 30,000 leucocytes, and once I found 40,000 on the ninth day. Also during the third week there is still a pronounced leucocytosis of 10,000 to 12,000 as an average, and sometimes as much as 24,000. With the fourth week the leucocyte counts approached more to the normal, but as a rule there is still a slight increase during the whole period of observation during the fourth to sixth week, being 9,000 to 12,000 as an average; even numbers of 14,000 to 16,000 are not rare without other especial reason. It seems to me that the curve of leucocytes during the whole disease shows an oscillatory movement, which may be the expression of the oscillating fight between the virus and the antibodies produced by the organism. So I am also inclined to consider the leucopenia in the beginning of the disease as the expression of the insufficient resistance of the body against the virus of smallpox. I have the impression, that the leucocyte reaction is specifically directed against the smallpox virus and independent of the secondary suppurative germs, because I often saw a high leucocytosis previous to suppuration or even in many slight cases, which passed almost without any marked suppuration.

Besides the increase of numbers there are regularly considerable changes in the different classes of leucocytes, revealed by the differential count.

During the whole time of observation the polynuclear cells remain below the normal of 64 to 66 per cent. In the first six days the numbers are 30 to 20 per cent. and sometimes go down to an average of 12 per cent.; in the second and third week they rise slowly to 45 per cent. and keep between 30 to 40 per cent. in the fourth to the sixth week. Thus the decrease of the polynuclears is pronounced and characteristic during the whole disease.

The juvenile forms, normally not more than 1 to 3 per cent., in the first week are increased to 15 to 35 per cent. on an average, being highest in the first days. They remain increased to 4 to 10 per cent. during the whole observation. The transitionals are also increased during the first week; later their number is normal, about 1 to 3 per cent.

The eosinophiles are much increased in number and have an especial importance for diagnostic purposes. During the first three weeks they keep at 3 to 10 per cent.; during the fourth to sixth week the increase is still more marked, being 15 to 20 per cent. on an average, and occasionally as much as 30 per cent. As in many other acute infections in smallpox the presence of the eosinophiles may be considered as the expression of a powerful and favorable reaction of the body against the infection.

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*Medical Research Laboratory, Health Department, Republic of Cuba.

[1] W. H. Hoffmann: The diagnosis of variola by inoculation of the cornea of the rabbit (*Medical Record,* November 26, 1921).

Corresponding to the marked decrease of polynuclears generally I found a pronounced increase of lymphocytes. With the exception of the first week almost all the counts have been above the normal of 24 per cent., as also the whole curve of average counts. The averages rise in the first week up to 45 per cent. and in the third up to 65 per cent. Also in the fourth to sixth week the curve is maintained between 40 to 50 per cent. During the whole period of observation of six weeks values of 60 to 75 per cent. are not rare. The lymphocytosis is also characteristic for smallpox.

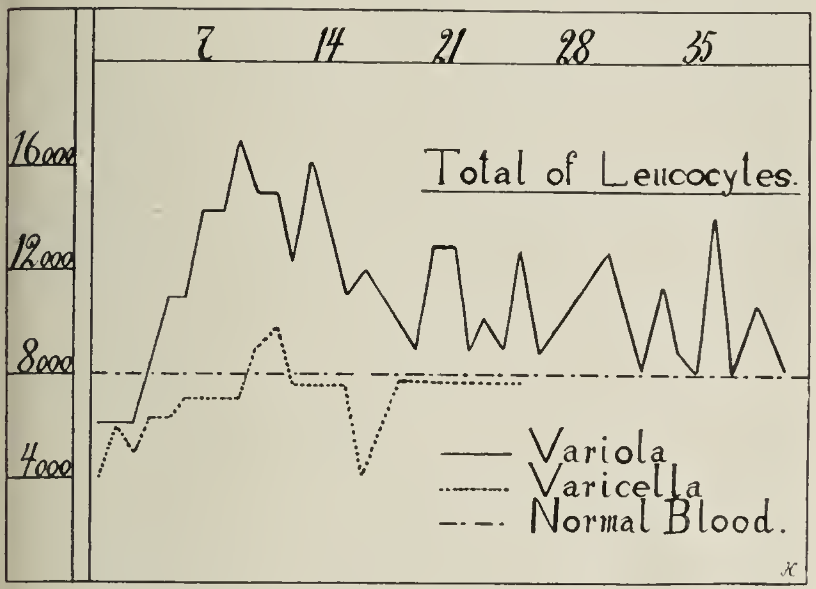

Fig. 1.—Total leucocytes in smallpox and chickenpox.

The large mononuclears are increased during the whole period from 4 to 8 per cent., the highest values being found in the first two weeks.

An especial importance in smallpox must be attributed to the presence of certain pathological cells, the myelocytes, which almost never are missed in smallpox, at least in the first three weeks, when on an average there are found 1 to 3 per cent. not seldom 4 to 5 per cent. and sometimes as much as 12 per cent. They have an especial importance in diag-nosis as they are not found in normal blood.

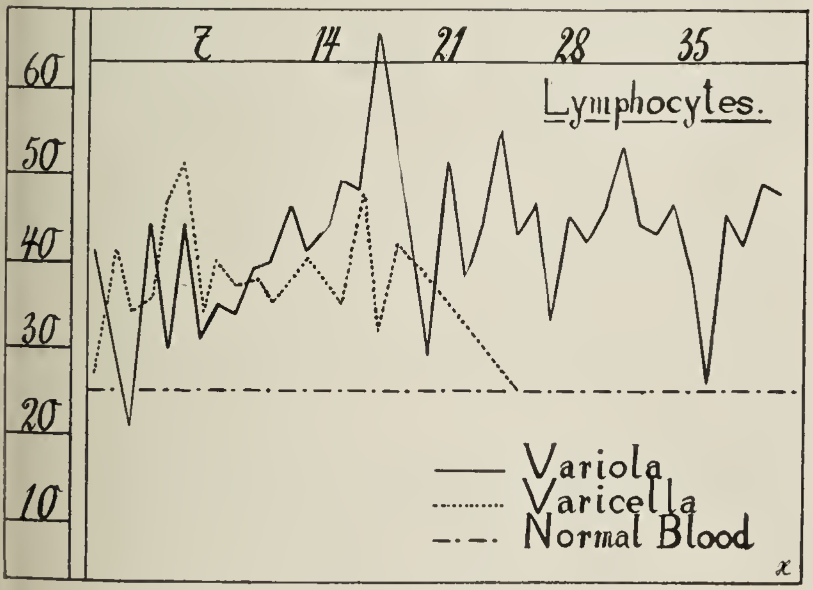

Fig. 2.—Lymphocytes in smallpox and chickenpox.

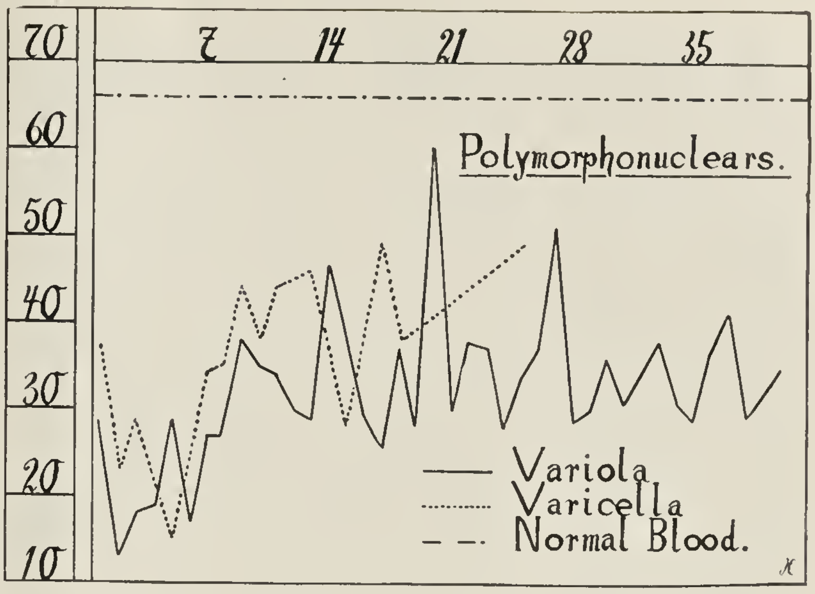

Fig. 3.—Polymorphonuclears in smallpox and chickenpox.

The study of the nuclei of the polynuclear cells after the method of Arneth has likewise revealed characteristic changes. In the first week the juvenile forms with one to two nuclei are markedly increased; later their number becomes normal. The cells with three nuclei are more or less normal in number. The forms with four to five nuclei, being low in number during the first week, are increased in the second to sixth week. Corresponding to those changes the Arneth index is high in the first week, rising to 90 instead of a normal number of 62. Later it is going down even to subnormal values and approaches the normal with the sixth week.

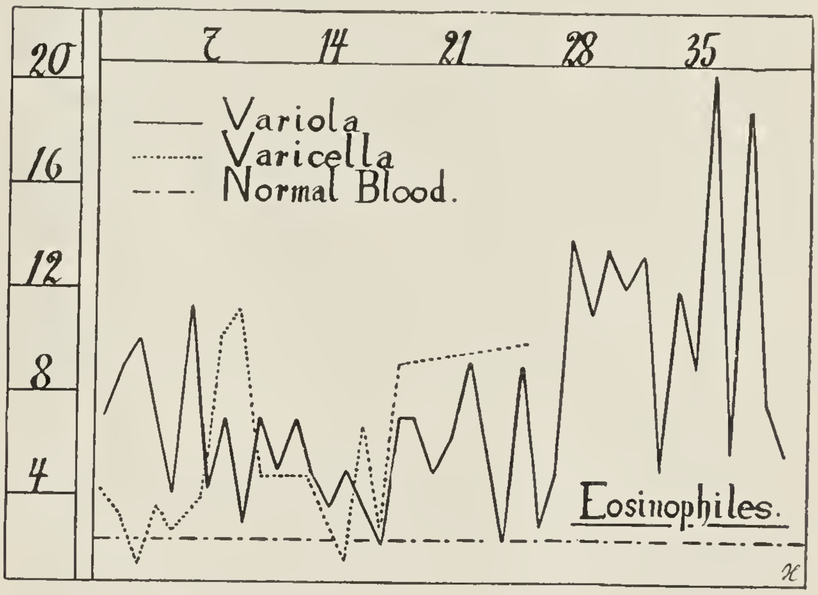

Fig. 4.—Eosinophiles in blood in smallpox and chickenpox.

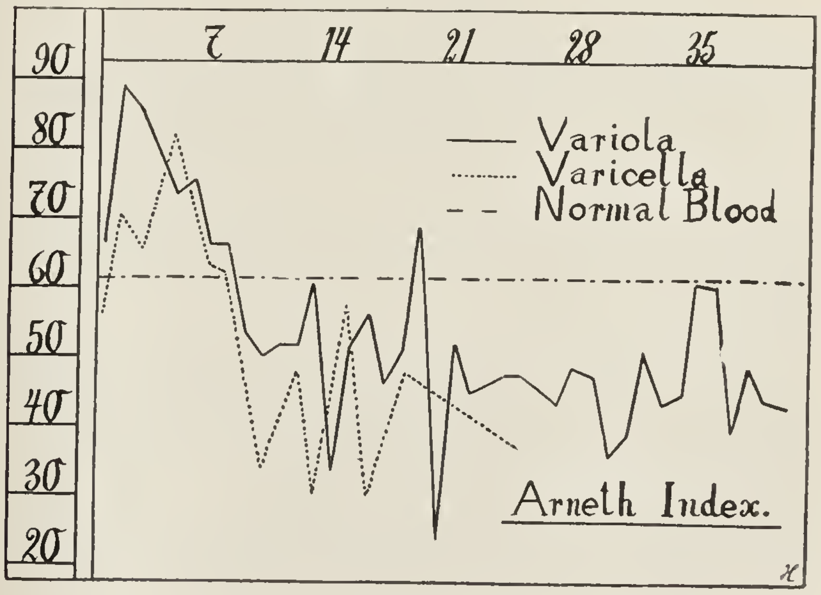

Fig. 5.—Arneth index in smallpox and chickenpox.

CHICKENPOX.

In chickenpox the total number of leucocytes is little affected by the infection. Generally in the first week the numbers are subnormal, between 3,000 to 7,000. About the ninth and tenth days the average number may be a little over the normal, because there are occasionally some cases with 10,000 to 12,000 leucocytes. After that time the total number goes down again to the normal and occasionally even to leucopenic values.

Whereas the absolute count thus scarcely shows any characteristic changes, the differential count reveals typical and pronounced alterations of the blood. The polynuclear leucocytes are diminished during the whole disease, the first week to an average of 30 to 15 per cent. and in the second to 45 to 30 per cent.; after that time the number is rising slowly to the normal.

The juvenile forms are especially increased during the first week up to 15 to 25 per cent. In the second and third week they go slowly down to 15 to 5 per cent. In a similar way the transitionals are increased in the first five days to 4 to 7 per cent. and later go down to 1 to 2 per cent.

The eosinophiles are not essentially increased during the first week. In the second to third week they are increased, showing values of 4 to 10 per cent. on an average. I could make very few observations after that time, but I think that the high number of eosinophiles continues for some time, perhaps being important for the cure of the disease and for the immunization of the body. On the twenty-fifth day I found still 10 per cent. eosinophiles.

The leucocytes during the whole period of observation are markedly increased up to 30 to 50 per cent.; in the first week the numbers may be as high as 75 per cent.

The great mononuclears are generally increased to 6 to 8 per cent.; sometimes the values are much higher, even more than 20 per cent.

Regularly I found myelocytes. In the first week they show an average of 1 to 2 per cent. and sometimes 4 per cent. In the second and third week they are less frequent and begin to disappear.

Consequently in varicella the total number of leucocytes generally is normal or even subnormal. There is marked lymphocytosis and corresponding to it a decrease of polynuclear cells. Eosinophilia is marked. Generally myelocytes are present.

CLINICAL APPLICATION OF THE RESULTS.

From my observations I conclude that the study of the blood can be used with especial profit for the diagnosis of the two diseases here considered.

In smallpox it is especially the marked leucocytosis, which after the third day has its importance for the diagnosis and must call the attention in suspicious cases and if found in repeated observations may give security to an otherwise doubtful diagnosis.

The diagnosis is still more supported by the differential count, which will reveal the characteristic changes in the numerical relations between polymorphonuclears and lymphocytes, the pronounced or even high eosinophilia, the presence of myelocytes, the changes of the Arneth Index.

In varicella there is no such increase of leucocytes, but here also exist pronounced changes in the differential count, which may be of practical diagnostic value and which are similar to those found in smallpox, with the inversion of the numerical relations between lymphocytes and polynuclears, marked eosinophilia, presence of myelocytes, and high index of Arneth at the beginning.

An especial importance under those circumstances must be attributed to the differential diagnosis of variola and varicella. We have seen, that the principal difference in the blood is given by the total number of leucocytes, which in variola is markedly increased after the first three to four days, whereas in varicella slight increases are met with only exceptionally about the eighth to ninth day. The differential count shows only significant gradual differences in the two diseases, which have no practical importance for the differential diagnosis. During the first three days the results of the blood study may be similar in the two diseases.

The hematological changes are so typical, that if they are missing in a suspicious case, this may be used with very much probability against the diagnosis of variola and varicella.

The results published here are averages abstracted from three hundred observations, all of which were made by me personally. Of course, in single cases the alterations may be found more or less pronounced, but principally all the countings without exception show the same wellmarked hematological character of the blood changes, which makes them such a valuable help for diagnostical purposes.

RESULTS.

In sixty cases of variola and forty cases of varicella comparative blood studies were undertaken with the intention to form an opinion about the value of such methods for clinical and sanitary purposes of diagnosis.

The differential count in both diseases reveals pronounced but identical changes, characterized by high lymphocytosis with a corresponding reduction of the number of polynuclears, high increase of eosinophiles, presence of myelocytes, changes in the Arneth index. Those changes show a distinction from other diseases with similar clinical symptoms.

For the differential diagnosis of the two diseases it is decisive, that in variola the number of the leucocytes is regularly highly increased for weeks, whereas in varicella there are normal numbers or only a slight increase from the eighth to the tenth day.

If in a clinically suspicious affection the typical blood changes are missing, the diagnosis of variola or varicella can be excluded with a fair degree of safety.

The changes are marked in variola for forty days and in varicella for twenty days at least, probably longer.

The degenerative changes in the red cells and the hemoglobin, though present, are slight and of no great specific importance especially in the tropics.

CONCLUSIONS.

The study of the changes of the leucocyte formula presents a practical and reliable clinical method for the diagnosis of smallpox and chickenpox. Probably further studies in other epidemics on the same line may help explain the character of the present epidemic. The question of alastrim might also be studied with good results by similar methods.

The Effect of the Placenta on Menstruation

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The menstrual function is directly dependent upon the ovaries; without ovaries there is no menstruation. This has been so firmly established that it may be looked upon as axiomatic. It is equally true that for their perfect development and function the ovaries are dependent upon the other glands of internal secretion. It follows, therefore, that any change in the menstrual function must necessarily predicate a change in the function of the ovary and its aides; so that an increased function of these glands will produce an increase in the menstrual flow, and a decreased function of these glands, a decrease in the menstrual flow.

Now the menstrual flow is readily observable, and from its premenstrual manifestations, its regularity, duration, quantity of blood lost and accompanying phenomena, it is possible to arrive at a definite idea as to the function of the ovary and its associated glands. This being so one may use the menstrual flow as a therapeutic index in instances in which abnormalities in the function of these glands exist.

The glands which support the ovary, both trophically and functionally, are particularly the posterior pituitary, the thyroid and the adrenal, especially the cortical portion. Those which depress the ovary and its allies are the thymus, the mammary, and the placenta. The efficacy of the thymus and mammary in this direction has been studied in a previous series of cases, and it is to determine to what extent the placenta exercised this function that the present series of cases is reported.

It has been demonstrated that the syncytial cells surrounding the impregnated ovum from the earliest moment are thrown off into the circulation, dissolved and absorbed. These cells stimulate the continued growth of the corpus luteum. During this time and later when the placenta fully formed has assumed this function, the menstrual function is as a rule in abeyance and remains so for the full duration of the pregnancy.

It has been further demonstrated experimentally that the presence of the maternal decidua inhibits ovulation as long as the corpus luteum has not been removed. From its similarity in behavior, both chemical and thermal, the effective secretion of the placenta is thought to be analogous to the lipoid substance obtained from the corpus luteum cells. It is furthermore stated that the placenta exerts a restraining influence on the posterior pituitary and it is this inhibitory action which in part explains the effect of the placenta during its active existence.

In order to determine what practical value these considerations may have, a series of twenty-five cases was selected in which the extract of placenta was administered in five grain doses regularly three times a day. In all of these cases the patient had a menorrhagia of greater or less intensity, as a prominent symptom. The duration of the menstrual periods varied from five days to two weeks. In the majority of cases there was an associated dysmenorrhea. The onset of menstrual life occurred between twelve and thirteen years of age in eighteen instances.

The pathological conditions present included tubal and parametrial inflammation in sixteen cases, fibroids in three cases, subinvolution in three cases, retroversion in two cases, and cystic ovary in one case.

The pathological conditions tending to produce congestion undoubtedly cause a hypersecretion of the ovaries, as it is not likely that the increased menstrual flow is due merely to an increased vascularity of the organs concerned.

The placental extract was continued for at least three months in order to be certain of producing any action if it were effective.

RESULTS IN TWENTY-FIVE CASES.

The results were rather interesting, and in some cases remarkably prompt and quite pronounced. In the twenty-five cases observed four showed no change in menstrual function, and the other twenty-one cases, or eighty-four per cent., all showed a diminution of the amount of blood lost. The duration of the menstrual flow was reduced; whereas originally the flow lasted from five days to two weeks, it now lasted from two to seven days. In some instances the duration of flow was unchanged, but the amount of blood lost was noticeably diminished. The discomfort and pain during menstruation was considerably diminished in many instances. The blood pressure during the taking of the placental extract usually fell on an average of ten mm. No ill effects were reported from prolonged taking of the extract, except in a few instances in which nausea and vomiting occurred.

One of the cases under consideration presented several features of unusual interest, and so well illustrates the effectiveness of the action of placental secretion that a fuller report is here rendered.

CASE REPORT.

Case I.—The patient, thirty-nine years of age, was a native of Italy, by occupation an embroiderer. Her family history was negative, as was also her previous history, except for an attack of pleurisy twenty years ago.

Menstruation began at the age of twelve years, was established regularly in a few months, occurred every twenty-eight days, was of eight days' duration, very profuse in amount, and accompanied by pains on the first day. There were no clots. Premenstrual manifestations consisted of a sensation of fullness in the breasts and the head two days before onset of menses. The patient suffered from extreme weakness after menstruation due to loss of blood. She had been married fifteen years, pregnant five times. The first pregnancy, which occurred fifteen years ago, terminated at the eighth month, with the instrumental delivery of a stillborn child. During the next eight years she had been pregnant four times, each terminating in a miscarriage, the last, seven years ago, at the fifth month of gestation. She had had no operations, bowels were constipated, urination negative. There was a slight leucorrheal discharge, no abdominal or pelvic pain. The patient was very nervous, high strung, easily excited, and had a violent temper.

General examination showed a woman five feet in height, weight ninety-nine pounds, thin and undernourished; skin fine and soft; mucous membranes anemic; glands not palpable; heart and lungs negative; pulse rate 84; abdomen negative.

A pelvic examination showed that the external genitals were negative; the urethra was negative. The pelvic floor showed a moderate laceration and relaxed pelvic outlet. The vagina was relaxed. The anterior wall showed a slight cystocele and the posterior wall a beginning rectocele. Cervix showed a bilateral laceration with scar extending into both lateral fornices of the vagina. The uterus was anteflexed, fundus freely movable, normal in size, outline and consistency; no tenderness. Adnexa were normal on both sides. Parametrium was negative. Cystoscopic examination revealed normal bladder wall, trigone and ureteric openings. Urine was negative. Blood Wassermann and complement fixation tests for gonorrhea were both negative. Blood pressure was 120-80 at the beginning of treatment, 105-70 three months later.

TREATMENT.

Treatment consisted of the administration of the extract of placenta five grains three times a day for two months. The first menstruation following the administration of placenta lasted two days, was slight in amount, with no pain and no clots. The second menstruation, twenty-eight days later, lasted two days, was slight in amount, no pain, no clots. The extract of placenta was discontinued. The third menstruation, twenty-eight days later, lasted two days, was also slight in amount, with no pain and no clots. During this time the patient said she felt better, was not so irritable and excited as heretofore. The patient failed to report after her next period, and I lost sight of her.

COMMENT.

The facts which point to the endocrine origin of the disturbance in this case may be enumerated as follows:

1. The early onset of menses indicating great activity of the glands controlling the menstrual cycle.
2. Profuse menstrual flow indicating hypersecretion of the ovary and the glands associated with it.
3. Repeated miscarriages indicating excessive stimulation of the uterine musculature due to hyperactivity of the posterior pituitary.
4. Marked underweight, thin and soft skin indicating excessive activity of the posterior pituitary and perhaps the thyroid.
5. Extreme nervousness, restlessness, and excitability, indicating hyperactivity of the thyroid and posterior pituitary.
6. Marked improvement produced by appropriate therapy.

In this case the response was rather more marked than the average.

While it is undoubtedly true that twenty-five cases are not a very large number from which to draw conclusions, yet the large preponderance of successful cases, and the long period over which they were observed, lend encouragement to the view that the secretion produced by the placenta is effective in controlling the hyperactivity of the ovary and the glands aiding it in its function, more especially since it is supported, not alone on theoretical and experimental grounds, but also by that ultimate criterion of all theory and therapy—results.

1141 Fox Street.

Threadworms in the Appendix

By LAMBERT ROGERS, M.R.C.S., Eng.,
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Late House Surgeon, The Middlesex Hospital.

Intractable cases of threadworms are occasionally met with. Osler records the case of a man of forty who had been subject to oxyuris vermicularis all his life and in whom all treatment had been ineffective.

It is conceivable that in cases of this type a nidus exists in some part of the alimentary tract not easily reached by ordinary anthelmintic treatment. This was observed in the following case:

Case.—Miss P. R., aged twenty-eight, had suffered from threadworms since childhood. The usual anthelmintic treatment, which had been carried out conscientiously on a number of occasions, was ineffective, the condition constantly recurring. My colleague, Dr. A. Brown, pointed out to his patient that her appendix might be the source of the infection and she clamored for something further to be done.

I was asked to see her and on January 29, 1923, removed a retrocecal and fibrosed appendix through the usual muscle splitting incision. On taking off the clamp from the base of the amputated appendix threadworms crawled out of the lumen in great numbers.

The patient left the hospital on the fourteenth day and has not passed a threadworm since the operation.

No doubt other cases of this nature occur, a focus of nematode infection existing either in the appendix or a saccule of the colon.

Corneal Injuries in Industrial Occupations*

By FRANK ALLPORT, M.D.,
Chicago.

Among the most frequent accidents to the eye encountered in industrial work are those cases where small foreign bodies are driven into the eye from emery wheels or other causes, and find lodgment either in the ocular cul de sac, or in the eyeball itself, and usually in the cornea. If the particle is in the cul de sac, it can either be found floating under the lower lid, or more usually, on the conjunctival surface of the upper lid, midway between the inner and outer canthi, from whence it can be easily removed by a cotton loaded toothpick, after the upper lid is everted. But if the particle is imbedded in the eyeball (and usually in the cornea) an entirely different condition confronts us. This kind of work should always be done under strict aseptic conditions, with clean hands and instruments, with local anesthesia, with concentrated illumination, with good light, and with strong magnifying glasses. I think I have seen more sad ocular outcomes from a neglect of these precautions, than from any other one cause, and yet, this kind of work is regarded as trivial by those who *should* know better.

Let us suppose that a foreign body has found lodgment in the cornea (and that a pigment spot in the iris has not been mistaken for a foreign body on the cornea—a mistake that is not infrequently made) two conditions should be ascertained, viz., the *location* of the particle, and the depth of its situation. If the invader is lodged outside the ordinary pupillary area, the situation is much less serious, but if it is lodged within the pupillary area, the case must be regarded with more apprehension. The reason for this is the extent and density of the scar that is so often the result of the operation of picking these particles from the tissues of the cornea.

The problem that confronts us is to remove the foreign body with as little corneal damage as possible, and without producing infection. Fortunately most forcibly driven particles are in themselves aseptic, rendered so by the friction of the blow, and the rapid passage through the air. Particles that fly through the air, however, from a smokestack, dirt from the streets, etc., are usually septic, and may be the initial cause of infection. They fly through the air, and perhaps lightly lodge in the cornea, or are rubbed in by the patient rubbing his eye after the accident, instead of leaving it alone, or washing it out, or lifting the lid, or going to an oculist at once for relief. Objects of this kind can usually be easily brushed from the cornea (after anesthesia) by cotton tightly twisted on a toothpick, and moistened in a mild antiseptic solution. Afterwards the eye should be irrigated, and argyrol solution and a bichloride ointment used, and this will usually end the case.

But when the foreign body is firmly lodged in the corneal tissues, an entirely different situation confronts us, for the object must then be picked out of its bed by an instrument such as a spud or cataract knife. The surgeon's hands, instruments, etc., should be strictly clean, the eye should be freely irrigated with boric or some such solution, the eye should be anesthetized, the light should be ample (either gas or electricity) and focussed upon the spot of operation by a strong convex lens held by an experienced assistant. The operator should magnify the illuminated spot by a strong convex lens held in his own hand through which he should look. He is thus working in an illuminated magnified area, and thereby to the best advantage. Some foreign bodies can be easily picked out with little or no corneal laceration, others require great experience, patience and ingenuity for their removal. Some are covered by a real corneal flap, others are so deeply imbedded that there is great danger of rupturing the cornea in the effort at removal, in fact, this unavoidable accident does sometimes occur, and the particle may drop into the anterior chamber, rendering an operation for its removal by a magnet or otherwise necessary. If it is steel, the magnet will withdraw it. If not, the opening of the cornea with a keratome may give it an impulse to present at the opening, from whence it can be picked out with forceps, or, it may be necessary to wash out the anterior chamber with an irrigator, in hopes of flooding the invader out, or sometimes it will be imperative to remove the foreign body through a keratome, opening by delicate toothless forceps. Jackson and others have devised magnifying glasses to be worn on the head, thus giving one the use of both hands.

In removing obstinately lodged foreign bodies, the greatest care should be exercised to do as little damage as possible, remembering that every scratch of the knife will leave a scar, and that eyesight will be impaired in direct proportion to the amount of scar tissue produced. This is especially true, of course, when the foreign body is lodged in or near the pupillary area. It is difficult to describe just how the foreign body shall be removed by the knife or spud. I think that experience is the best teacher. Three rules, however, should be observed: 1, get the instrument under the foreign body if possible, and lift it out; 2, injure the cornea as little as possible; 3, always work under ample and concentrated illumination. The eye should, of course, be thoroughly anesthetized, and foreign bodies and corneal abrasions can always be better seen if a fluorescin solution (two per cent.) is dropped in the eye, and then partially washed away by a bland irrigating solution. Personally, I like to stand behind the patient with his head resting on a headrest or my own breast. It is sometimes difficult to find the particle, it is so small, and the patient should look in all directions, and hold the eye as quiet as possible. Sometimes a particle can only be seen by getting a profile view of it, assisted by the staining properties of fluorescin, and one should be careful not to mistake a pigment spot in the iris for a foreign body in the cornea—a mistake that is not infrequently made —and (unfortunately) acted upon. After every particle of foreign material is removed (and the invader sometimes breaks up into a number of pieces) it is advisable to look the cornea over and see what has happened. Sometimes the foreign body is hot when it reaches the cornea, and is driven into its tissue, and a brown eschar is formed all around the site of injury. Authorities differ as to the advisability of removing this eschar. Some believe in leaving it alone, that it does no harm, that it is an actual protection to the underlying cornea, and that it will fall off in due course of time like a scab. Others believe that it acts like a foreign body and should be removed, which is easy to do. Personally I incline to the former belief, but I remove the eschar for the simple reason that inasmuch as the eschar is dark brown in color and looks like a foreign body, the friends of the patient invariably discover it and tell him that I have not removed the foreign body and do not understand my business.

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*Read before the Chicago Medical Society, December 6, 1922.

I have tried leaving the brown eschar many times but have been compelled invariably to take it out the next day on account of the dissatisfaction of the patient and his friends. Unless the foreign body is removed easily, the cornea is more or less damaged and needs attention. In the first place, the particle itself has injured the cornea by nesting in its tissues. Then the spud or knife (even where great care is exercised) injures the corneal tissue to a greater or lesser degree. Besides this, if the particle has been lodged for some time, especially if it carried infection with it, a state of ulceration has already begun, and serious consequences may ensue, especially if proper and vigorous treatment is not begun immediately. Where there is no ulceration, and hardly any corneal abrasions, the case may be treated with irrigation—argyrol solution (twenty per cent.) and bichloride ointment, and watched for a day or two. But if there is ulceration, or the cornea is much injured, it is advisable to gently touch the pathological tissue with carbolic acid. For this purpose a fine end of a toothpick is used, and a little cotton is tightly twisted on the point. This is dipped into carbolic acid, the superfluity of which is wiped off by touching it to a piece of gauze. The acid is then applied gently to the abraded cornea, and if the directions here given have been followed, the acid will not run or invade the healthy corneal tissue. Sometimes, however, if the ulceration has already begun, and is active, it will be well to have the cotton loaded toothpick act not only as a cauterant, but also as a curette, scraping up the dead tissue, and cauterizing the diseased area as well. The eye should then be irrigated —argyrol twenty per cent. solution instilled, also atropine solution and some bichloride ointment put in the eye and a gauze and cotton pad put over the eye and held in place by adhesive strips.

I consider it very important in these cases of corneal injuries, that the eye be protected by a pad. This prevents irritation and infection from the air, and the invasion of the eye by additional and irritating foreign bodies. This is the time to protect the eye from serious trouble, and if a few hours of protection and quiet will produce a healthy eye, then by all means give the patient the benefit of the wiser course. Of course when a foreign body can be brushed off from the eye with some cotton, there is no necessity for ordering a detention from business, but when there is any danger in sight, by all means give the patient the benefit of the doubt. I have had ignorant and selfish employers write me abusive letters for not returning employees immediately to work, when I am only trying to protect them from paying heavy damages for lost eyesight, and at the same time conserve the vision of the unfortunate injured man. If all goes well, the man may be returned to work the next day, but if there is any corneal abrasion as shown by the fluorescin staining, the man should remain under treatment until the cornea is completely healed. Corneal ulcerations are dangerous things. Ulcers and scars may occur in other parts of the body and no harm is done, but once infection of the cornea gets under way, it may spread with incredible speed, and in a few days the eye may be ruined or enucleated, or, at the best, dense extensive scars occur that produce much loss of vision and even blindness. Let no one speak flippantly of apparently trivial corneal injuries. There is no such thing. They all possess potential possibilities that should create anxiety until the safety point is reached.

It may be necessary from time to time to use other cauteries than carbolic acid. For instance, I sometimes use equal parts of carbolic acid and tincture of iodine, and sometimes fuming nitric acid, although great care should be exercised in its use, and as little used as possible. I have, of course, used a good deal the actual electric cautery, but it is so easy to puncture the cornea while using it that I have not used it much of late. Dr. Prince of Springfield, Ill., has devised an instrument which he calls a pasteurizer. It is a cone shaped mass of steel with a handle attached. The cone is heated in a spirit lamp until it is white hot, and then it is held a short distance from the ulcerated cornea. This is supposed to kill the bacteria. I have tried this instrument a good many times and have been disappointed in its use. Maybe I have not used it just right. I, however, like the instrument much for applying the actual cautery to a corneal ulcer. I heat it in a spirit lamp and then touch the ulcerated areas with the apex of the cone. The apex is rounded and blunt, and there is not near the danger of perforating the cornea that there is when the delicate heated electric wire is applied to the cornea.

In the treatment of bad corneal ulcers and their sequelæ, I have been much disappointed in the use of subconjunctival injections of bichloride, salt, dionin, etc. They are all painful, especially the mercurial injections, and patients almost invariably attribute all the disasters that follow to the injections. After giving them all a fair trial, I have abandoned them, and I can say the same of the subcutaneous injections of milk. I do not use it any more, and believe that its beneficial influence has been much exaggerated. Remedies of this nature sometimes acquire an undeserved reputation by ardent experimenters because a patient or two have done well while they have been used. This is no proof at all, but nevertheless does not deter them from rushing into print with glowing accounts of the wonders that have been performed. Prolonged use and much experience with careful and conscientious observations, alone warrant a claim of definite results for any remedy.

What then do I do for these dreadful cases of deep sloughing corneal ulcers, followed frequently by hypopyon, or pus in the anterior chamber, iritis with adhesions, panophthalmitis, and enucleation? I search for outside causes such as syphilis, kidney lesions (for diabetes sometimes plays a conspicuous etiological rôle in the tragedy), diseased teeth, tonsils, sinuses, lacrymal diseases, etc. X ray pictures and modern transillumination are of great assistance in searching for these causes. If I find any focus of trouble I try to relieve it as far as is consistent with the patient's ocular condition. I have seen removal of the tonsils or diseased teeth, and draining of some of the head sinuses play a wonderful part in some apparently hopeless cases of ocular infection. I put the patient to bed and give him a cathartic and plenty of water to drink. I regulate his diet and see that he is not overfed. I give him about 120 grains of salicylate of soda in twenty-four hours, and direct that he shall have a mercurial inunction once a day—rubbing in with the palm of the hand, a piece of mercurial ointment about half as large as a peanut, for fifteen minutes by the clock—into some hairless portion of the body—and then washing off what is left with soap and water. The place in the body should be changed from day to day to avoid dermatitis. If he has trachoma or hypertrophic papillary conjunctivitis, I give his everted lids a thorough brushing with a toothbrush and boracic acid powder two or three times a week, and have helped many very stubborn cases by this procedure. Where trachoma and corneal ulceration occur in the same eye, copper crystal, strong solutions of silver nitrate, etc., should not be used; they increase ulceration.

To the inexperienced, exclusion of copper crystal, etc., and inclusion of tooth brushing the lids may seem like curious advice, as, at first thought, the tooth brushing process would seem to be more severe than the copper crystal treatment. This presumption, however, is erroneous. Tooth brushing or brossage is not irritating. Its beneficial effect on the ulceration is sometimes immediate. The smoothing of the palpebral conjunctiva and the hemorrhage from the brushing, have an antiphlogistic and soothing effect upon the ulcer, while the brushing of the lids with the copper crystal, even if thorough irrigation is used thereafter, seems to produce a lingering and potent irritation, extremely detrimental to the integrity of corneal tissue. The brossage should be followed, of course, by suitable treatment for the lids. The ocular secretions should be examined in the laboratory, and this will sometimes guide us to the best remedy to use. I may say, however, that most of these cases require rather strong solutions of argyrol, probably about a twenty-five per cent. solution. The tear ducts should be carefully examined for pathology, and if disease is found, it is best to open the lower canal, pass a large probe, and in a few days to irrigate the canal with an antiseptic solution such as argyrol. These irrigations should not be made for several days, however, for if liquid is passed through the passages before the cut surfaces have healed, the liquid is apt to pass into the neighboring tissues and produce an ugly swelling—and if argyrol is used, an indelible staining of the tissues. The nose should also be examined and if ethmoidal disease, a badly deflected septum, polypus, or other obstruction or disease is found, steps for relief should be promptly taken. If he has syphilis, I see that he has proper treatment. I cauterize the ulcer when necessary, but cauterization should not become a routine habit with the surgeon. The eye should be given a chance to get well, and sometimes too much cauterization blocks recovery.

In my hospital we use what is called the intensive treatment in such cases. This consists in using a drop of one per cent. atropine solution every five minutes for half an hour (six applications). Where atropine is used so freely, great care should be taken to prevent constitutional effects. The nurse should stand behind the patient and pull up the upper lid. She should then allow one drop to flow over the cornea, and then press the tear duct for a moment with the finger to prevent the atropine running down the tear passages into the nose and throat. In this way the danger of constitutional effects will be reduced to a minimum. Meanwhile, during the half hour period, heat is continually applied to the eye. I prefer an electric bulb with gauze around it, but if this is not possible, hot water may be applied with thick gauze cloths or with a hot water bag. The heat should be as strong as the patient can bear. At the end of the half hour of atropine and heat, dionin should be used, commencing with a five per cent. solution. A ten per cent. solution will soon be necessary, and then even the powder. A marked edematous condition of the conjunctiva should be produced, and dionin soon wears out its power on one individual, and increased strength from time to time becomes necessary. When even the powder no longer produces edema of the conjunctiva, it may be stopped, for it is no longer useful and is only an irritant. In ten or fifteen minutes after the dionin has been used, the treatment may end by putting in the eye some bichloride and atropine ointment. This completes the treatment, but it should be gone through with three times a day. If it is thought that the dionin is producing too much irritation, it can be used only once a day. If atropine produces unpleasant effects, its use will have to be diminished, or even stopped, at least temporarily. Argyrol solutions may be used during the treatments. Almost all cases of ulceration of the cornea will yield to this treatment.

I have often thought that good results were obtained in these bad cases by the use of pilocarpine or other sweats. They should be given daily for a few days and then at intervals. When pus forms in the anterior chamber, the treatment just outlined will frequently dissipate it. But, of course, in many cases the pus remains and increases in volume. In such cases I open the lower portion of the cornea at the floor of the anterior chamber with a rather broad keratome, and wash away the pus with warm normal salt solution and my anterior chamber irrigator. This will sometimes stop the progress of the disease, but unfortunately many of these cases are so virulent in their nature that pus reaccumulates, and the eye is lost from a general panophthalmitis and enucleation becomes necessary. This, then, is the end of many cases of neglected or poorly or even well treated minor corneal injuries. The lesson to be learned is—let such minor injuries be properly treated from the very start.

7 West Madison Street.

Retrobulbar Neuritis Associated with Diseases of Nasal Accessory Sinuses

With Report of Two Cases

By EMANUEL L. FALK, M.D.,
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While much has been written on the subject of diseases of the eye caused by diseases of the nasal accessory sinuses, this report of two similar cases of retrobulbar neuritis is made to call attention again to the intimate relationship that exists between diseases of the optic nerve and diseases of adjoining structures, and emphasize the importance of early recognition of the causes in cases of amblyopia and its proper treatment before signs of optic atrophy occur.

The relation between affections of the nasal mucosa and superficial eye conditions is often clinically observed (such as diseases of the conjunctiva lacrimal and cornea). We now recognize also that there is a connection between deeper seated and more serious ocular disturbances and diseases of the nasal accessory sinuses. These conditions may be caused by absorption of toxins from a focus of suppuration within the sinuses, acting just like a focal infection in other parts of the body, such as iridocyclitis, which I observed recently was cured by operation on the nasal accessory sinuses, or by direct contact between a pathological process in the sinuses and some ocular structure.

I shall confine myself however to inflammation of the optic nerve in the form of retrobulbar neuritis, manifesting itself only by disturbance of vision and a central scotoma without visible changes in the nervehead on ophthalmoscopic examination. The visual defect varies greatly, from an enlargement of the blind spot, only to be detected by careful perimetric examination, to the loss of light perception.

Retrobulbar neuritis is located in the orbital division of the optic nerve; hence seldom do we find changes in the papilla upon ophthalmoscopic examination, but in the later stages, or, when the disease subsides, signs of atrophy frequently make their appearance.

This takes place when the destruction of the fibres of the optic nerve has taken place, within the region occupied by the focus of inflammation. In most cases the disturbances of vision are confined to the central portion of the visual field which are supplied by the papillomacular bundle.

The lesion of this bundle may be even so slight as not to interfere with acuity of vision at first, and, if we simply stop at determining this, we may not discover any disease of the optic nerve at all; but by testing out the visual field, with a small colored object, it may show a diminution in the centre, the ability to appreciate color. Especially is it important to test out the blind spot; which, according to Van der Hoeve, enlargement of the blind spot could be detected much earlier than the visual field defect and is an early sign of posterior sinus trouble. (This probably explains the reason for the rarity of optic nerve trouble as compared with posterior sinus trouble which is common.) In some cases, however, the lesion increases rapidly to the point of complete blindness; as the subjoined cases demonstrate.

PATHOLOGICAL ASPECT.

Fuchs gives the following explanation. "In the optical canal, the dural sheath of the optic nerve is transformed into the periosteum of the bony canal; hence the optic nerve in this situation is enveloped only by the delicate pial sheath, which in most places is applied to the periosteum and on the upper side is actually adherent to it. This anatomical relation facilitates direct transfer of inflammation from the cavities in the vicinity of the canal to the optic nerve itself.

This inflammation first affects the pial sheath of the nerve, and we should therefore expect that the peripheral bundles of nerves which are next to this sheath would be the first diseased. These bundles supply the periphery of the retina; but in these cases on the contrary it is the centre of the retina that becomes insensitive, hence a central scotoma; which proves with certainty that there is a lesion of the papillamacular bundle, which in the canalicular segment of the nerve occupies just the middle of the nerve trunk, i. e., it is the part farthest distant from the inflamed sheath. This is explained by assuming that the fibres of this bundle are particularly vulnerable and connect this vulnerability with its especially exquisite and delicate function, with which perhaps there is associated a correspondingly delicate anatomical structure. The more delicate a machine the more rapidly it is destroyed."

REPORT OF CASES.

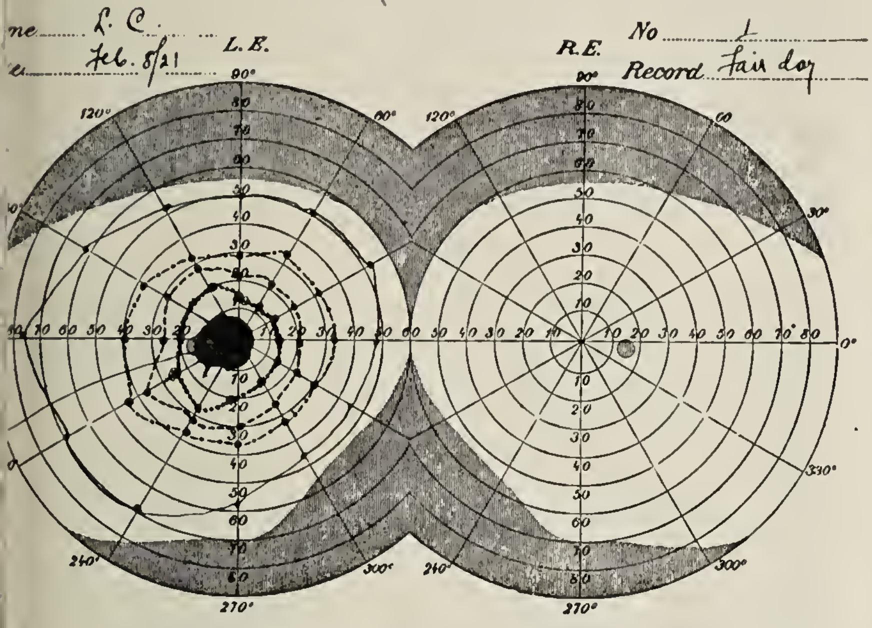
CASE I.—January 22, 1921. Mrs. L. C., aged eighteen, no children, born U. S., occupation housewife, past history and family history negative, general health good. Present illness dated back three days only. Patient noticed a sudden diminution of vision in her left eye, which failed rapidly until three days previously, when she presented herself in the eye clinic at the Manhattan Eye, Ear and Throat Hospital for treatment.

Examination of the acuity of vision: OD=20/15. OS= failed to count fingers, light perception was present, pupil did not react to light and accomodation. Fundus examination was negative. Wassermann, uranalysis, and x ray of sinuses were ordered. January 25, 1921—three days later, vision OD=-20/15. OS= no light perception and no pupil reaction. Fundus, left disc less distinct in outline than the right; otherwise negative.

Blood and urine were negative x ray findings practically negative. Clinical examination of nose and throat showed a high deviated septum, otherwise normal. Dr. E. S. Thompson, our chief, advised opening the sinuses. His reason was that, in view of the seriousness of the condition exploration was justifiable.

She was operated upon January 26, 1921. Ethmoids and sphenoids freely opened, no gross pathological changes were found clinically.

The specimen consisted of several fragments of soft tissue and bone, sections showed ulcerations of the turbinate covering with dense infiltration of lymphocytes and polyps. The mucus glands were active and hyperplastic. The bone showed no distinct obliterations. Laboratory diagnosis chronic hyperplastic inflammatory tissue.


L. C.
Feb. 8/21
L.E.
R.E.
No 1
Record Fair day
90°
120°
60°
30°
240°
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330°
270°
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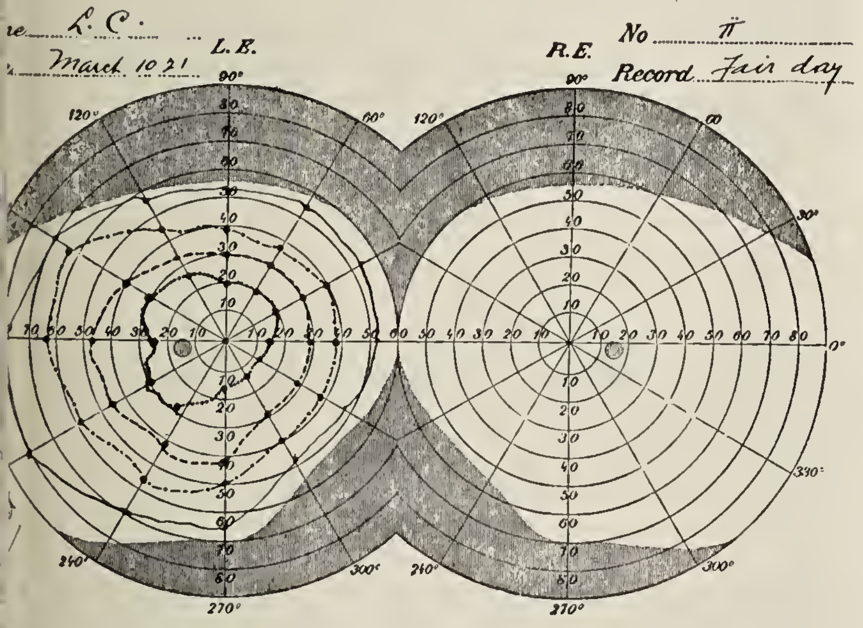
FIG. 1.—Field of vision in Case I on February 8th, after operation.

February 1, 1921: Vision OS.=counts fingers at six inches, the 3rd; vision OS. 20/200, the 5th; vision OS. 20/200, the 8th; vision OS. 20/70—Field taken as per Fig. 1, the 10th; vision OS. 20/40 ++, the 15th; vision OS. 20/30+, March 3rd; vision OS. 20/20, March 10th; vision OS. 20/15 O. U. Field normal as shown by Fig. 2.


L. C.
March 10/21
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No II
Record Fair day
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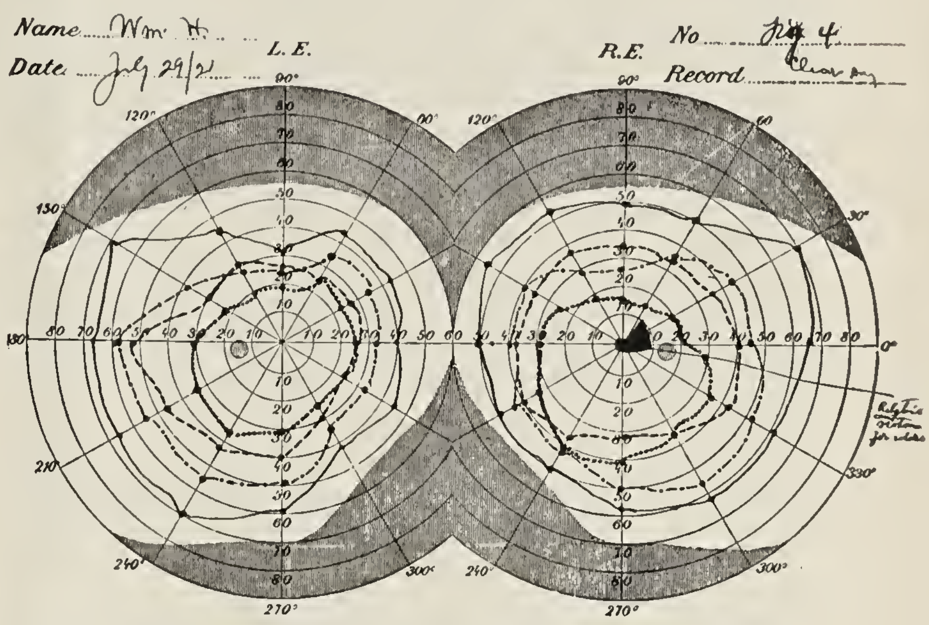
FIG. 2.—Showing normal field of vision in Case I.

CASE II.—W. H., aged thirty-two, clerk in bank, past history and family history, negative. General health good, present history dated back to January, 1920, when he had an inflammation of his left eye which subsided in a few days, later noticing that the vision in his left eye was poor. An oculist refracted him with homatropine and found that the right eye was emmetropic and the left eye could not be corrected, informing him that his left eye was amblyopic.

June, 1920, about six months later, he noticed a blurring of vision which increased daily, compelling him to give up his position. He consulted a local ophthalmologist under whose care he remained for six weeks without any improvement. Wassermann and uranalysis were negative; x ray of the sinuses was reported clear. October 20, 1920 he consulted me with the history given above. Examination—OD pupil 4 mm. Reacted to light and accommodation, convergence poor, vision 6/200. OS pupil 3.5 mm. Reacted to light and accommodation, convergence poor. Vision 2/200. He said that his vision seemed clearer in the dark. Ophthalmoscopic examination—There was a slight pallor of the temporal side of the disc in both eyes, otherwise negative. Field.—An absolute central scotoma as shown by Fig. 3. No history of tobacco or alcohol. A diagnosis of retrobulbar neuritis was made. I advised another x ray, spinal Wassermann, and stool examination. Examination of stools was negative. He refused another x ray and spinal test. I then referred him for a neuro-


Name Wm. H.
Date July 29/21
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240°
300°
330°
270°
Relative scotoma for white

FIG. 3.—Field of vision in Case II, showing central scoloma.

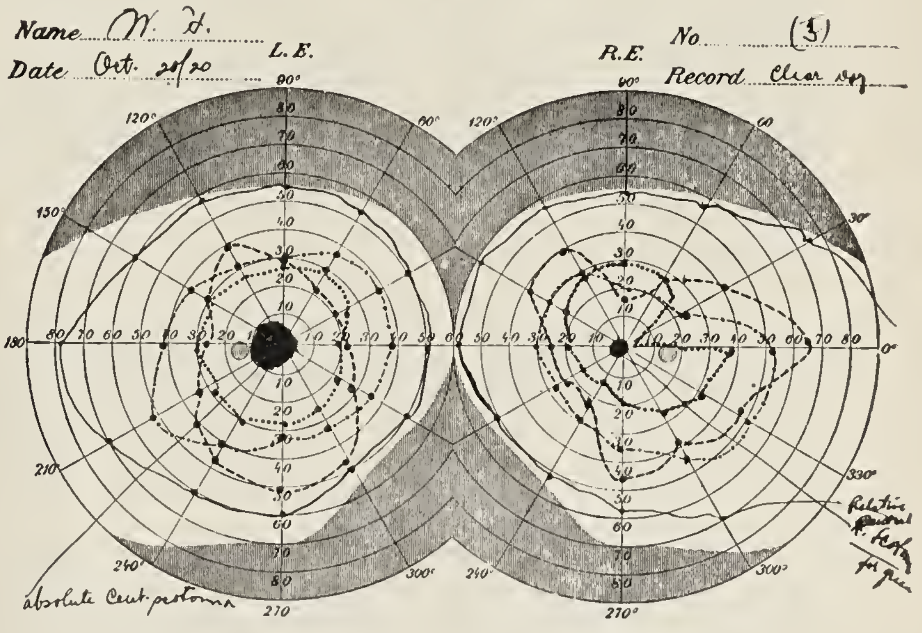
Name W. H.
Date Oct. 20/20
L.E.
R.E.
No (3)
Record Clear day
90°
120°
150°
60°
30°
180°
0°
210°
240°
300°
330°
270°
absolute Cent. scotoma
Relative Central Scotoma for [illegible]

FIG. 4.—Field of vision in Case II after operation.

logical examination. Instead, he consulted a general surgeon for an occasional abdominal pain, who found a chronic appendicitis and advised removal which was done. January, 1921, he returned to me without his appendix, but his eye condition was much worse. Examination.—OD=fingers at ten feet not distinct. —OS fingers at six feet not distinct. The nerve much paler than on previous examinations. I referred him to the Neurological Institute for diagnosis and spinal test. The result was negative.

He was put there on eliminative treatment, but without any improvement. April 22, 1921, he came back and consented to have another x ray taken which was done at the Manhattan Eye, Ear and Throat Hospital.

X ray report—Frontals very large, with mild involvement. Ethmoid showed moderate involvement, no septa shown especially posterior, evidently an old process. Left antrum moderate involvement in the floor, Right antrum showed severe involvement throughout. Sphenoid large show moderate involvement.

May 5, 1921—A submucous resection and complete opening of ethmoids and sphenoids was performed. May 23rd—Vision OD=10/200, OS=8/200, June 14th—OD 15/200 with—100S=20/200 OS=15/200 with—75CX 180=20/200.

He said that he saw objects more distinctly and was able to recognize people in the street, which he could not do before operation. July 29, 1921—OD w-100S=20/200, OS w-75CX 180=20/100.

He read books of fine print and was very happy, because, as he said: "Considering that I could not read any print nor recognize objects, I appreciate the difference now." Field as shown in Fig. 4.

These two cases present a striking contrast for our consideration. In Case I. the patient was seen during an active stage which progressed within three days from seeing fingers to no light perception. Prompt operative interference gave immediate relief and complete recovery within a short time.

Case II. presents an entirely different picture. The acute stage probably occurred a year previous when the left eye was first involved. It was not of such an active nature. The right eye became involved seven months later, yet, after operation, the left eye, while of longer duration, had recovered more than the right. It is probable that the right optic nerve was more severely involved, hence atrophy occurred quicker than in the left.

While both nerves already showed signs of atrophy, the operative procedure was considered the only possible chance of saving any fibres not destroyed. That this step was justified was shown by the gradual subsidence of further activity in both eyes, especially the left one.

If this patient would have been operated upon at the time when the left eye was only involved, it is fair to assume, that he would have had as satisfactory results as the first case.

SUMMARY.

1. The striking feature in Case I. is the sudden onset of the visual disturbances and the rapidity with which complete blindness occurred and its equally rapid improvement after operation.
2. In Case II. the visual disturbances were rather gradual and at no time was there complete blindness, and the little improvement was equally gradual.
3. In both cases there was no visible evidence of diseases of the sinuses, yet opening the sinuses brought about prompt relief in first case and showed improvement in the second case.
4. In severe cases, the failure of sight may be very sudden, so that in a few days it may attain such a degree that all perception of light is abolished, as in Case I.
5. Central scotoma makes itself apparent to the patient by nyctolopia, hence, when a patient states that he sees better at night than in daylight always look for a central scotoma.
6. In cases of amblyopia, not due to errors of refraction, do not be satisfied until all possible causes have been excluded.
7. In retrobulbar neuritis cases which are not too far advanced, the sight can be brought back again to normal if the cause be promptly removed.

2915 MERMAID AVENUE.

Report of One Hundred and Four Mastoid Operations

By J. MORRISSET SMITH, M.D.,
New York.

The following report includes 104 mastoid operative cases just as they came under my supervision at the New York Polyclinic Hospital prior to its acquisition by the Government during the war. Of the total of 104 cases, seventy-two were acute and twenty-two chronic mastoid infections.

Included in the acute cases were sixteen subperiosteal abscesses, eleven of the acute infections showed a streptococcus mucosus capsulatus infection. Twenty-one of the total of the acute cases showed a perisinus or epidural abscess. No record was kept of the number of cases in which the sinus or dura was exposed by the operator—estimated about twenty-five per cent. In all of the acute infections, there was a thorough removal of the mastoid cells, the cavity was then swabbed with tincture of iodine followed by alcohol, the upper two thirds of the incision closed with clamps or silkworm gut, the wound was then packed with iodoform gauze. This routine was carried out when sinus or dura was exposed by the operator as well as in those cases showing a destruction of the dural plate by the disease.

Instead of leaving the wound open, it was partially closed but still enough of an opening maintained to allow it to be thoroughly cleansed at each dressing until the purulent secretion disappeared. The wound was then allowed to close. This answered the threefold purpose of shortening the convalescence, insuring safe healing and at the same time lessening the deformity.

The first complete dressing was done on the third day and the dressings repeated every day or second day thereafter until the healing was complete.

In all the seventy-two acute cases the patients recovered. There were three deaths in the twenty-two chronic infections; one from a temporosphenoidal abscess, one from a cerebellar abscess and one from a thrombosis of the lateral sinus followed by a double cavernous sinus thrombosis.

In nineteen of the twenty-two chronic cases radical mastoid operations were performed. There were no injuries to the facial nerve during the radical operation. In order that some definite idea might be obtained of the results following the radical mastoid operation, ten of the chronic cases were taken just as they presented themselves in the clinic; first examined and the hearing recorded, the radical operation was then done, a personal postoperative treatment carried out and the postoperative results with the hearing recorded. The whole series of ten cases were then presented before the Otological section of the New York Academy of Medicine. Nine of the ten were completely dry, one had a slight mucoid discharge from the eustachian tube. Eight of the ten showed improved hearing following the operation. For detailed report of the ten cases, see *Laryngoscope*, August, 1918.

Six of the nineteen radical cases showed a cholesteatoma; following a careful radical operation and removal of the cholesteatoma, all of the postauricular wounds were closed and there was no recurrence of the cholesteatoma in any of the six. One of the cholesteatoma patients was brought to the hospital in an ambulance in a semiconscious condition with a temperature of 104°F. and evidence of a beginning meningitis. Operation disclosed an enormous cholesteatoma with an extensive destruction of the dural plate in both the middle and posterior fossæ. Following a very extensive operation, he eventually made a complete recovery.

Two of the other cholesteatoma patients came in with high temperatures and symptoms suggesting meningeal involvement. Both made complete recoveries following radical operation.

Two cases which were not primary mastoid infections but were secondary to traumatic fractures of the skull are purposely omitted from the above series. For detailed report, see *Journal A. M. A.*, April 5, 1919.

The first of the three deaths was due to a temporosphenoidal abscess. The patient, man aged fifty-six, admitted to the hospital for observation. Chronic discharge left ear over twenty years duration. Examination showed destruction of drum membrane with a very scant but foul smelling discharge from region of attic. No definite symptoms were present upon which a diagnosis could be made but on sudden elevation of temperature to 103°F., operation was decided upon. Operation showed a complete bony sclerosis of mastoid structures, there being no cells present of any kind. Upon opening and enlarging the mastoid antrum, a small hole was found through the bony roof which apparently led into the brain in the midfossa.

Subtemporal decompression showed a tense dura and incision evacuated a large brain abscess, drainage was instituted but patient died two days later from a diffuse meningitis.

The second death was due to a cerebellar abscess. Female, aged forty-two, brought into the hospital in an ambulance with history of a mastoid operation at another hospital, several days previous. Severe headaches, insomnia, temperature 101° to 102.5°F.: spinal fluid negative. Conditions grew steadily worse and a diagnosis of brain abscess was made. Exploration of temporosphenoidal lobe negative. Exploration of cerebellum behind sinus negative. Patient's condition poor so time was not taken to explore cerebellum from in front of sinus. Patient died following day, postmortem showing small cerebellar abscess anteriorly which exploration from behind sinus failed to penetrate by the eighth of an inch. This shows the importance of an exploration anterior to the sinus when possible in all operations for suspected cerebellar abscess.

The third death was that of a boy, aged nine, with a double chronic aural infection present since infancy and showed the result of neglect in the chronic cases. Male, aged nine, ambulance case, temperature 104°F., mind hazy, partial Kernig present, foul smelling discharge and tenderness behind both ears. Immediate operation showed double cholesteatoma with large perisinus and epidural abscess, right side. Both mastoid cavities were drained, the diseased bone around the perisinus and epidural abscess removed, patient returned to bed. Temperature came down to normal with progress satisfactory until sixth day, when temperature suddenly jumped to 106°F. Blood culture positive, showing streptococcus present.

Due to the presence of a double infection, the lateral sinus was quickly exposed on the opposite side and found normal. The right sinus was then exposed and found completely clotted. The jugular was resected above the facial vein, the sinus then opened and free bleeding obtained from the torcular but not from the bulbar end. The patient was observed for four days; the high temperature continued, the wound was reopened, and the bone removed so the packing could be placed directly in the bulb. The infection extended into the cavernous sinuses and the patient died of a double cavernous sinus thrombosis, one month after the primary operation.

This patient had been to several clinics and given drops and nothing further advised and well illustrates the result which we may expect where they are neglected as he was. A radical operation advised sooner would have undoubtedly prevented the resulting intracranial complication.

RESULTS.

Total number of operations, 104. Total number of deaths, three—the death in each instance being due to an intracranial extension of the infection prior to the examination and operation by me.

25 West Fifty-first Street.

Massive Neoplasm of the Lung with Paralysis of the Diaphragm*

Recovery After Intensive Deep Röntgen Irradiation

By J. HENRY SCHROEDER, M.D.,
Cincinnati.

Contrary to every conception of the development of therapeutical processes, we find ourselves confronted, in the clinical application of intensive deep röntgen irradiation, with certain demonstrable results that cannot be founded upon experimental data. While these results must momentarily be accepted as clinical facts, in the course of time we may be able to draw clinical conclusions that will tend to establish a working basis for safe and effective clinical application of intensive deep roentgen irradiation.

I desire, therefore, to report a case of malignant neoplasm of the lung, in which prompt recovery of the patient followed the application of two socalled carcinoma doses of intensive deep röntgen irradiation. It will be apparent from the accompanying röntgenograms that this case lends itself exceptionally well to a demonstration of the pathological condition before treatment, as well as of the results accomplished by the röntgen irradiation. For obvious reasons a histological examination of the new growth could not be made. I am indebted to Dr. William Rienhoff, of Springfield, Mo., for the history of the case. He referred the case for irradiation and through his cooperation the continuous clinical record has been made possible.

Case.—M. C. B., the patient, referred on April 13, 1922, was a well preserved man, fifty-nine years of age. He stated that he had been in good health until shortly before Christmas, 1921, and his previous history suggested nothing of interest in connection with his present illness. Dr. Rienhoff's report was as follows:

"The patient was examined the first time in November, 1921, and again on April 4, 1922, when a decided increase in the morbid condition was noted. The loss in weight in that period had been about eleven pounds. The affected half of the right lung showed complete dullness on percussion and pronounced bronchial breathing on auscultation. There had been little expectoration, an occasional feverish temperature toward evening, and shortness of breath, quite intense upon slight exertion. The sputum, such as could be obtained, did not show any tubercle bacilli. The complement fixation test for tuberculosis was negative, as was also the Wassermann test. The blood examination showed only secondary anemia. The röntgenogram (Fig. 1) shows a well circumscribed, deep shadow, quite extensive, on the upper half of the right lung, apparently affecting the upper lobe and part of the middle lobe. Under fluoroscopic examination there was a noted marked contrast in the respiratory expansion of the sound left side and the affected right side. Therefore, a diagnosis was made of pulmonary tumor, and under the existing circumstances it was probably of a carcinomatous character."

I made an examination of the patient at the time of his first treatment on April 14, 1922, which confirmed Dr. Rienhoff's observations. The patient stated that he coughed only moderately. The surface lymphatic glands were not enlarged. There was very limited chest expansion on the right side and no evidence of pleural exudate. Nothing abnormal could be detected on the part of other organs.

At that time stereoscopic lung plates revealed a dense infiltration of the parenchyma of the upper half of the right lung (Fig. 1), fusing with clearer lung tissue of the lower part of the lung. The marked peribronchial infiltration just below the mass is strikingly shown in the röntgenogram, which also revealed the elevation of the right side of the diaphragm. Fluoroscopically the diaphragm on that side was found to be immobile. The paralysis can be accounted for by the almost inevitable compression of the phrenic nerve above. The larynx was not distorted. The condition admitted therefore of a direct diagnosis of neoplasm of the lung, with secondary paralysis of the diaphragm on the involved side. The condition of the patient indicated the malignant character of the new growth. I undertook the irradiation because of the still comparatively good physical condition of the patient that promised good resistance.

On April 14, 1922, I administered the minimum carcinoma dose of Wintz, that is, 100 per cent. of the surface erythema dose of the ultrahard röntgen rays at 200,000 volts maximum, to the tumor mass in the lung, in one treatment. I used one large area of entrance anteriorly and one posteriorly, corresponding in extent to the easily demonstrable area of lung involved. In order to maintain a maximum effect I administered seven days later an additional thirty per cent. of the carcinoma dose through an available area that had not been exposed during the first irradiation.

The systemic effect of the irradiation was mild. The evidence of lung irritation—increased cough and tightness in the chest—became evident in twenty-four hours and subsided in the course of a week. The surface irradiation erythema was mild. With the subsidence of the systemic reaction the patient's condition improved visibly. He had gained two and one half pounds in weight ten days after the irradiation, when he departed for his home in Springfield, Mo., and again came under the observation of Dr. Rienhoff.

Dr. Rienhoff reexamined the patient on May 23, 1922, about six weeks after the first irradiation dose. His report follows:

"1. The general subjective condition has decidedly improved. The patient feels better, is stronger, able to walk any distance, any length of time, and up and down stairs without getting tired or short of breath. The cough has entirely disappeared. The appetite is excellent.

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*Accepted for publication in February, 1923.

"2. Objectively, his general appearance has changed, he has good color and a bright expression. His weight, which had come down to 152 pounds, has come up to 154½ pounds. His pulse is 72, full and strong. The temperature has been normal throughout the time after his return.

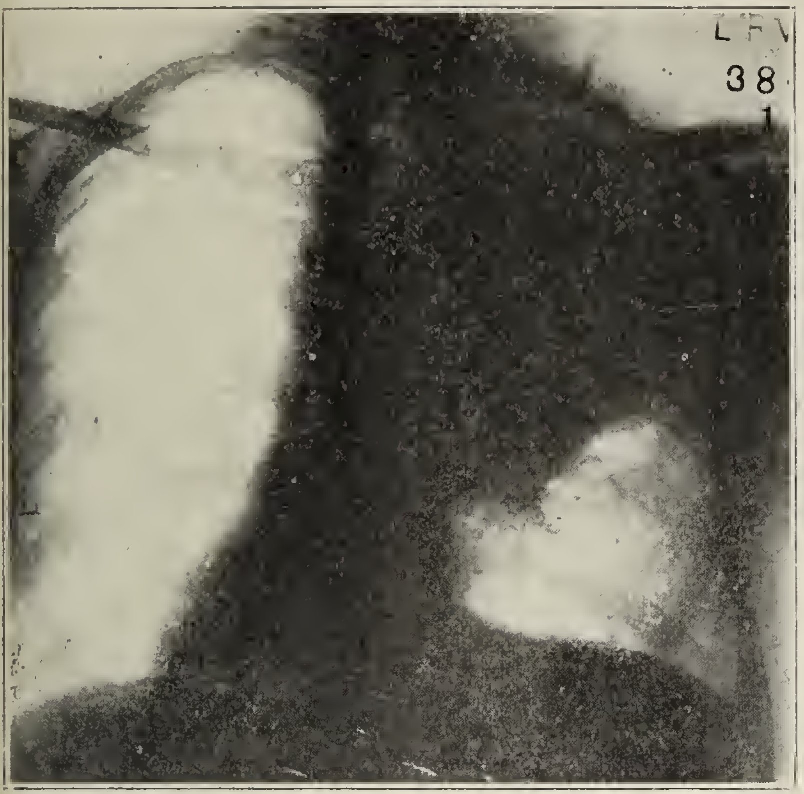

Fig. 1.—Lung before röntgen irradiation, showing extent of tumor, the marked peribronchial infiltration of adjoining lung tissue and elevation of diaphragm, right side.

"3. The extent of dullness on the right side has decreased, and so has the area over which the sonorous bronchial breathing was so distinct. There is a space over which distinct vesicular breathing is to be heard, covering a small portion of the upper right lung, laterally to the dull part.

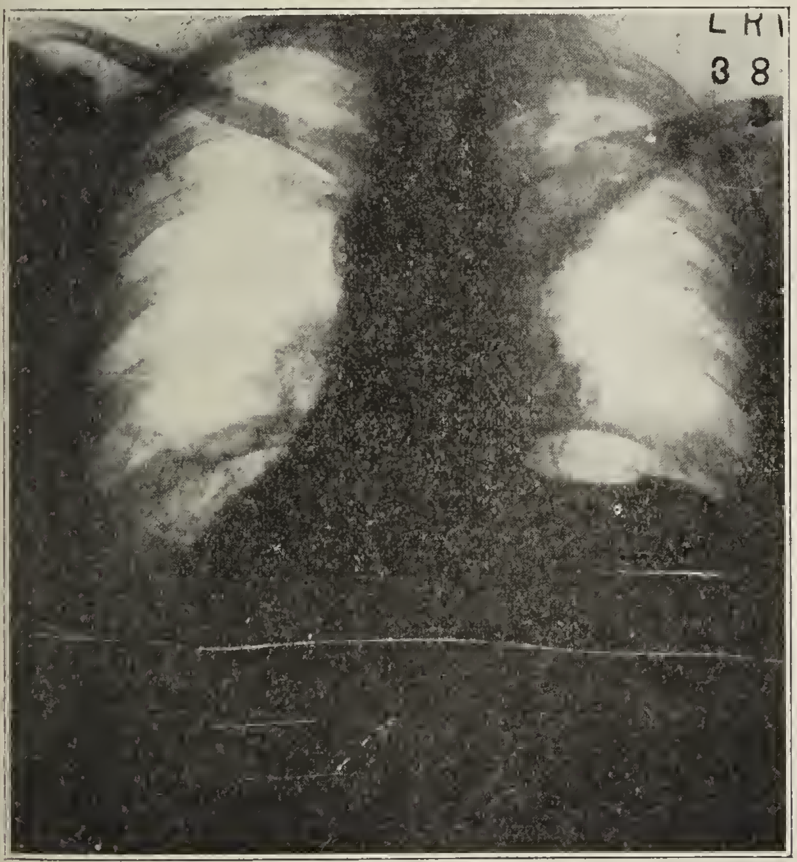

Fig. 2.—Lung six weeks after first röntgen irradiation dose, showing marked retrogression of tumor, diaphragm paralyzed.

"4. The shadow in the upper right lung as shown in the radiogram (Fig. 2), when compared with the intensity and extent of the former picture, speaks for itself. The expansion of the right lung, however, as shown in the fluoroscopic examination, is still quite limited. In fact, the movement of the diaphragm on the right side is almost nil. It appears as if there must be a disturbance, possibly a compression of the phrenic nerve, near the entrance to the thoracic space.

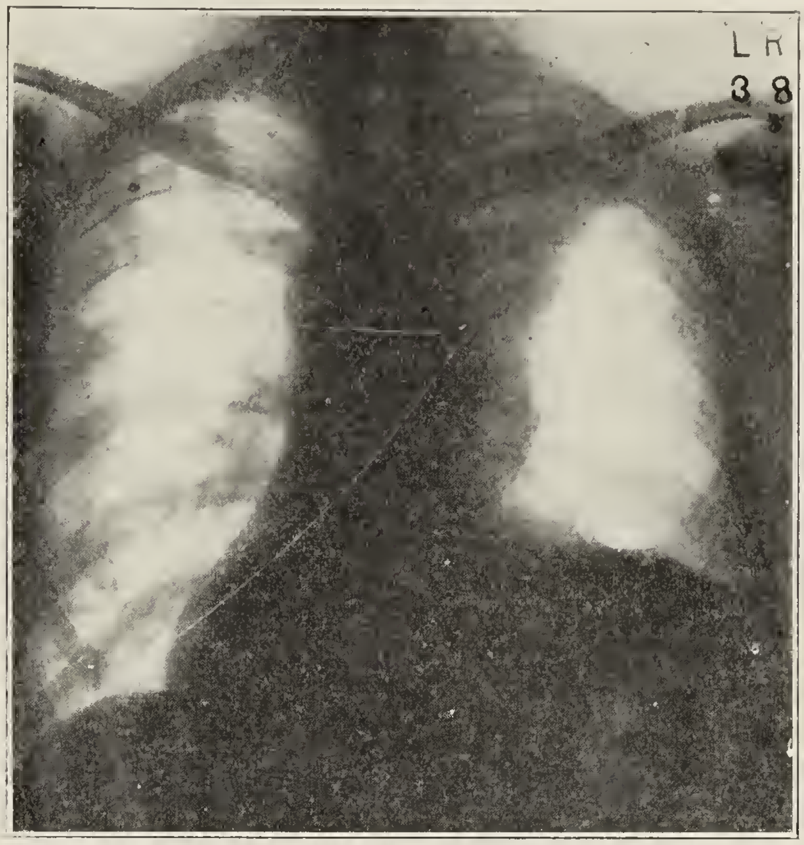

Fig. 3.—Lung about six weeks after second röntgen irradiation dose; further retrogression of tumor. Diaphragh still paralyzed.

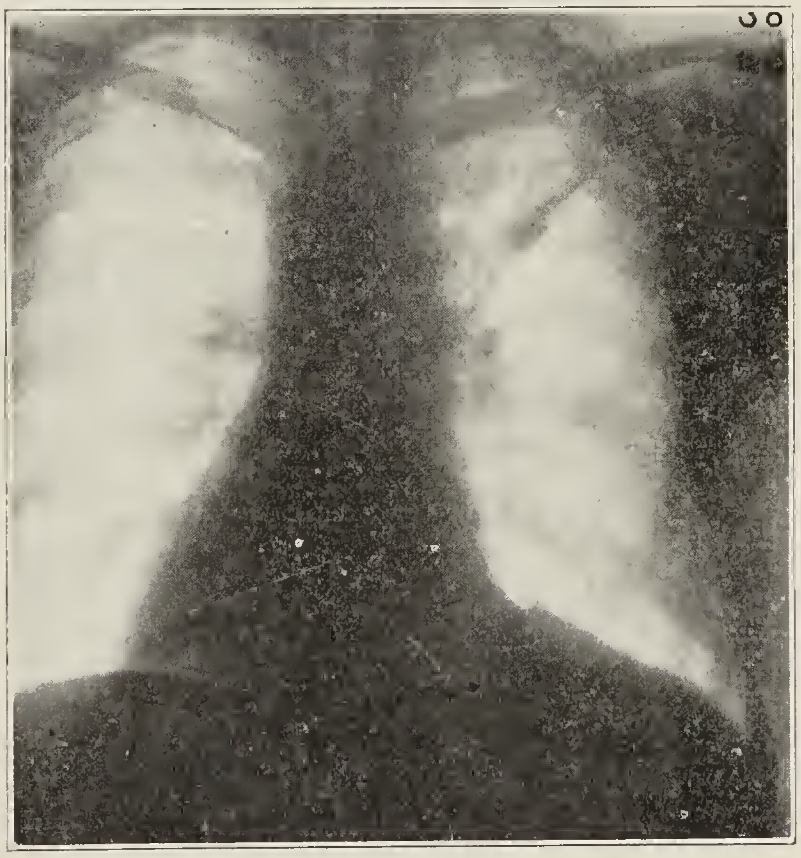

Fig. 4.—Lung four months after second röngten irradiation. The neoplasm has disappeared and the paralysis of the diaphragm has subsided. The area formerly involved by the neoplasm shows apparently a slight connective tissue proliferation.

"5. No trace of exudate could be found.

"6. Nothing abnormal could be detected in any other organ or tissues."

It will be noted that the tuberculosis complement fixation test before the irradiation was negative; after the intensive röntgen irradiation it was reported two plus positive. I am informed that only a two plus fixation test for tuberculosis under such circumstances may be accounted for by a protein disturbance through an absorption of tumor constituents after the irradiation.

I administered the second dose on June 6 and 9, 1922. The technic was the same as that described above, with this difference, that in order to obtain in the greatest degree a homogeneous radiation dose throughout every part of the tumor tissue, separate doses of 100 per cent. of the Wintz units were administered to the upper portion of the tumor and to the lower portion, including the hilus region, three days apart.

The immediate effects were the same as those recorded after the first irradiation dose. The röntgenogram of July 27, 1922 (Fig. 3), shows the retrogression of the tumor mass, but the diaphragm is still paralyzed.

Dr. Rienhoff reported under date of August 10, 1922: "The condition of Mr. B. is excellent. . . . None of the former morbid symptoms are noticeable, except the objective physical signs in the small area revealed by the x ray plate." (Fig. 3).

The last roentgenogram (Fig. 4), made on October 12, 1922, reveals the lung free from evidence of the former tumor, and the paralysis of the diaphragm has disappeared. There is noticeable in the formerly involved area an increased density that suggests connective tissue proliferation (to which I shall refer in my comment).

A final fluoroscopic examination was made by Dr. Leslie R. Webb, of Springfield, Mo., on November 15, 1922. His report is as follows:

"Both lungs inflate equally. Hilus shadows increased in both lungs. Right apex slightly more dense than left, with shadow extending from about two cm. below the clavicle in outer border of apex to six cm. below clavicle internally. Ribs move through normal excursion during inspiration. Diaphragm moves through normal excursion during inspiration and expiration, each side moving equally, left and right side in normal proportion. Costophrenic angle clear. Cardiophrenic angle clear."

Under date of October 13, 1922, and again on January 22, 1923, Dr. Rienhoff reports:

"Mr. B. is apparently perfectly well. He has no complaint to make of any kind. He works as much and as vigorously and with as much ambition as ever. There is no respiratory impairment whatever. His weight is 168 pounds. That represents a gain of sixteen pounds since the first irradiation."

The problem of safe and effective roentgen irradiation of the lung is the problem of resistance and reaction of lung tissue, under pathological conditions, to the absorbed radiation. The effect of the required röntgen radiation doses upon lung tissue must obviously determine our recourse to, and the applicability of, this form of treatment. Clinically, it is the effect upon lung tissue under pathological conditions. Experimental data are not available, and indeed, it seems difficult to conceive of a plan of systematic research in this field under clinical conditions.

In place of logical development of the problem there stand forth bluntly two demonstrated facts:

1. Hines (1) has made a valuable report of a case of spindlecelled sarcoma of the lung which was subjected to röntgen irradiation; the radiotion dose was not stated. The patient was given three applications in the course of four months. During the last series of treatment respiratory distress developed, and several days later death occurred. Necropsy and histological examination revealed an extensive fibrosis. "All parts of the lung were consolidated from proliferation of connective tissue in the alveolar walls, with resultant great decrease in air space, which accounts for the dyspnea and cyanosis, and might be considered as the immediate cause of death."

2. The case which I have reported here, as well as a case that I previously demonstrated (2), wherein both lungs were effectively and safely irradiated for diffuse secondary sarcoma, proves that under certain conditions two successive sarcoma doses and two successive carcinoma doses, as stated, were not followed by a pathological fibrosis of the lungs, but were therapeutically effective and resulted in the immediate recovery of the patient.

One might reasonably expect some proliferative connective tissue reaction after the absorption of large doses of röntgen radiation by pathologically altered lung tissue, either as a primary reaction to the irradiation, or as the result of retrogression of tumor masses, or both. It is logical to assume that the degree of such a reaction would vary with the radiation dose and the nature of the pathological involvement of the lung tissue. I have been able to demonstrate in the sarcoma case, referred to above, that two sarcoma doses applied to the lung with an interval of six weeks, did not give rise to a recognizable röntgen fibrosis even after the complete retrogression of the tumor mass. A reexamination on February 1, 1923, one year after the irradiation, revealed the lung still entirely free from recurrence of tumor and any tendency to fibrosis.

In the case reported here, where I administered two carcinoma doses, that is, thirty per cent. greater than the sarcoma dose, I find that I advised the patient's physician at the time of the first irradiation of the probability of a subsequent connective tissue proliferation in the involved and irradiated area. Judging from the final röntgenogram, after the irradiation and the fluoroscopic examination, this anticipated connective tissue proliferation has in fact occurred, not as a pathological fibrosis, but seemingly as a biological phase in the reaction of the tissues to radiation doses of that degree, and retrogression of pathological tissues.

Intensive röntgen irradiation of one half of one lung involved by a malignant neoplasm, with two successive carcinoma doses, resulted in the disappearance of the tumor. It was followed by a recognizable increase in density, as revealed by röntgen examination, which resembled in appearance a connective tissue proliferation in the formerly involved area. There are no manifestations of reduced air capacity, and the patient is apparently well.

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The Neurological Phase of Otology*

A Simple Presentation of the Bárány Tests

By MERVIN C. MYERSON, M.D.,
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The neurological phase of otology embraces a science in itself, the science of neurootology or otoneurology. This science is of value to the medical man in general because of his occasional or frequent encounter with patients complaining of vertigo, and to the neurologist and the neurological surgeon in particular, because of the connections between the internal ear and the various intracranial centres which communicate by their fibres with the entire body. Physiological experiments on the semicircular canals were performed by Flourens in 1828 and continued by Goltz, Crum-Brown, Breuer, Ewald, and others. In the past fifteen years Bárány, particularly, has placed the knowledge and findings of these various workers on a practical basis, and a science has been elaborated which has a recognized place in medical diagnosis. In this country Shambaugh, Friesner and Braun, Mills, and Jones and Fisher, have contributed to our knowledge of this subject.

It has been established that the internal ear has, in addition to its auditory function, a mechanism concerned with the appreciation of position in space and the maintenance of equilibrium. That portion of the internal ear which is concerned with equilibrium is known as the vestibular apparatus or labyrinth. This consists of a vestibule and three semicircular canals. Each canal contains within its membranous interior a fluid, endolymph, and has an ampullated end which lodges a sensory end organ, the crista. Motion of the endolymph in one direction or the other, within the canal, stimulates the nerve filaments in the crista and sends forth an impulse from it; the type of impulse varying according to the direction of the flow of endolymph. It is disturbances of these endorgans, singly or collectively, that cause disturbances in the function of the labyrinth which may show themselves spontaneously as nystagmus and vertigo, at times associated with nausea and vomiting. Artificial stimulation similarly will produce disturbance of these endorgans and cause nystagmus and vertigo. Nystagmus is a twitching or rhythmic jerking of the eyes in a given direction. Vertigo is a lack of appreciation of one's position in space due to a disorder or disharmony of the impulses that tend to maintain equilibrium.

Impulses are constantly going to the eye muscles to preserve their normal balance relationship. This normal balance relationship is disturbed by disease or by artificial stimulation of the labyrinth and this disturbance is recognized as nystagmus. In a like manner impulses are traveling from the vestibular apparatus to the muscles of the body to maintain their tonus; this is borne out by the fact that disturbance of the labyrinthine function will produce vertigo and falling. Ewald demonstrated that animals in which the labyrinth has been destroyed, show a lack of tonus of the body muscles.

In the consideration of vertigo produced by labyrinthine lesions, it must be remembered that the sense of touch, visual impressions, and impulses from the muscles, joints and tendons, help to preserve body balance. These perform the function of the static labyrinth when it is destroyed, but do so very poorly at first, because as Friesner explains: "The centres in which all these impulses are gathered, accommodate themselves to the loss of the normal influences of the static labyrinth, and a compensation results." Because of this new conception of vertigo, and because it is registered within a definite part of the brain, such terms as gastric vertigo, renal vertigo, or cardiac vertigo are considered erroneous. All vertigo is due to an involvement of the internal ear or its intracranial pathways, which constitute the apparatus responsible for vertigo. The stomach, heart or kidney produce vertigo, not directly, but by their influence upon the labyrinth or its pathways.

Where vertigo exists, frequently nausea and vomiting may also be present. This is true of vertigo artificially produced or produced by disease. Nausea and vomiting are produced by the spreading of an abnormal impulse from the vestibular nerve nucleus to the vagus nucleus which lies close by.

Special tests have been devised for establishing the integrity of the vestibular apparatus, and for diagnosing disease of it. These tests consist of: The turning or rotation test, the douching or caloric test, the galvanic test, and the fistula test.

The galvanic test consists of stimulation of the labyrinth by a galvanic current. The fistula test consists in the compression or aspiration of air in the external auditory meatus in the presence of a fistulous opening somewhere in the labyrinth. The most practical and most universally applied tests are the turning and douching tests.

For the turning or rotation tests[1] the patient is placed in the Bárány chair or its modification and turned a given number of times at a given speed. The head is placed at an angle which will bring the canals to be tested in the horizontal plane. With a given normal stimulus, such as the turning produces, the labyrinth reacts in such a way as to create a normal response in the phenomena of nystagmus and vertigo. A normal response indicates that the labyrinths are functioning normally and the tracts responsible for the responses are intact.

The caloric test consists of douching the ear with cold water at 70° F. or hot water at 110° F. This douching has an advantage over the turning in that a single labyrinth can be examined at a time, whereas in the turning both labyrinths are tested simultaneously. The impulse which is generated in the semicircular canals is due to the current set up in the endolymph when it is cooled or heated. The cooler portion of the endolymph is constantly seeking a lower level. This is the cause of the endolymph movement. The normal nystagmus and vertigo which result from this test are indicative of a normal labyrinth and intact pathways. Abnormalities in reaction are interpreted as abnormalities in the labyrinth or the pathways.

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*Read before joint meeting of Brooklyn Neurological and the Flatbush Medical Society, February 9, 1923.

In addition to nystagmus and vertigo, reaction movements are produced as a result of stimulation. These reaction movements are always present when vertigo is present, and are considered a secondary manifestation of vertigo. Reaction movements, according to Bárány, are voluntary movements in the extremities or body, arising in the cortex which are modified in the cerebellum by impulses from the semicircular canals. If the impulses are not forthcoming from the canals, or are intercepted by a break in the pathways, or are abnormal because of the impaired function of the canals, the movements will be influenced accordingly. To elicit reaction movements of the extremities the past pointing test is employed; for the body the falling test is used. A normal person can touch a fixed point with his eyes closed when told to do so; whereas, after his labyrinth has been stimulated, he will not be able to touch the fixed point, but will point past it. The falling test is evidenced by the reaction of falling when any of the canals have been stimulated in a vertical plane. These tests prove the influence of the labyrinth upon the cerebellum in respect to coordinated or synergistic motion. These tests and the reactions which result therefrom demonstrate the following facts:

There is a connection between the semicircular canals and the eye muscles in the production of nystagmus. There is a connection between the semicircular canals and the cortex in the production of vertigo, for vertigo is a conscious phenomenon, and therefore cerebral. There is a connection between the semicircular canals and the cortex of the brain, by way of the cerebellum in the past pointing and falling reactions. That there are reaction movements for the extremities in the pointing test, and for the trunk in the falling test. This means that the impulses from the labyrinth can influence any part of the body.

The pathways from the labyrinth to the eye muscles are well known. The pathways between the labyrinth and the cerebellum, and the joints and muscles and cerebellum, and between the cerebral cortex and the cerebellum have been carefully worked out.

An examination of the labyrinth by the tests described furnishes us with definite information, in that they do or do not produce nystagmus, vertigo, past pointing, and falling. The production of these reactions are dependent not only upon the normal condition of the vestibular apparatus from which the impulses emanate, but also upon the integrity of the pathways from the labyrinth to various centres within the brain which preside over or influence these responses. As a result of this, the otologist can localize lesions that might involve the pathways from the labyrinth. As our knowledge of this relatively new science increases, the ability to localize intracranial lesions will increase, and this form of examination will become indispensable. Of conditions that involve the associated pathways, lesions have been localized in the cerebellopontine angle, the medulla, the pons, the cerebellar peduncles, and various parts of the cerebrum. At the present time, however, it would seem that these neurootological examinations do not promise the accuracy in diagnosis of intracranial lesions that has been asserted for them. Instances of an absence of neurootological findings in the presence of intracranial pathology which was demonstrated at autopsy or on the operating table have been reported. It would seem that a good deal more must be known before a series of infallible tests will be elaborated, if such is possible.

I have found these tests of particular value in cases of suspected malingering where deafness and vertigo follows head injury. The Barany tests have made of vertigo a true clinical entity. It must be borne in mind that the normal internal ear and its normal associated pathways keep the individual from having vertigo. A disharmony, or disbalance in the impulses emanating from the labyrinths, whether due to labyrinth disfunctions, or disturbance along the pathways to the intracranial centres, causes vertigo.

The otologist can assist in the diagnosis of cases of vertigo by establishing whether a lesion exists in the ear itself or in the pathways from the ears. In the internal ear we may have the effects of toxemia, hyperemia, anemia, or involvement of any degree due to a suppurative lesion. Of toxemias which affect the internal ear mechanism, the most severe are those of syphilis and mumps, while the most frequent are those from a focus of infection.

The following cases are reported to demonstrate the value of these tests:

CASE I. A. P., male, aged forty-seven, was referred by an internist June 13, 1922. His chief complaint was recurrent attacks of vertigo, which were associated with nausea, and had been occurring for the past six weeks. His attacks shortly before he presented himself, had been occurring every two or three days, until in the past few days they were coming on daily. These attacks had become so violent as to prevent his leaving his bed for two or three hours every morning. The patient associated his illness with his gastrointestinal tract because of his nausea. He was referred to the internist because of the suffering he experienced as a result of these attacks, during which he felt very much alarmed. The following is the report of the findings in this case, as submitted to the doctor who referred him:

"The history gives no evidence of a severe toxic factor that may have impaired this patient's vestibular function, such as mumps, syphilis, scarlet fever, etc."

Turning tests produced delayed and diminished reactions in nystagmus, vertigo and past pointing, indicating on the one hand, the integrity of the intracranial pathways, and on the other hand, almost a complete destruction of the labyrinths or eighth nerves (vestibular portion). Douching after four minutes gave very slight reactions. This is indicative of little function still remaining.

The otoneurological examination suggests an almost complete destruction (impairment of function) of both labyrinths or eighth nerves. A general toxemia of virulent type such as syphilis, is probably the only thing that could account for the findings which this man presents. His vertigo is due to the unequal projection of equilibratory stimuli going from the labyrinth on either side. This examination has definitely ruled out brain stem or intracranial pathway neoplasm. The nausea of which this patient complains is due to the stimulus spreading to the vagus nucleus from the vestibular nucleus whenever his disordered vestibular function asserts itself. The prognosis for eventual cessation of vertigo is good. Without antiluetic treatment this patient will continue to have vertiginous attacks until there is a total destruction of both labyrinths or eighth nerves. With antiluetic treatment there should be a gradual improvement and cessation of this distressing condition.

The diagnosis was rendered as a luetic involvement of the vestibular portion of each eighth nerve, with some involvement of the cochlear portion also. This report and diagnosis were rendered after the blood Wassermann had been reported negative and there was nothing in the history or physical findings to suggest syphilis. Upon receipt of the opinion above, the internist gave the patient an injection of mercury salicylate and placed him on fifteen grains of potassium iodide three time a day. There was almost an immediate cessation of symptoms after the mercury injection. The patient received another similar injection a few days later and passed out of sight for several months. He returned complaining of slight attacks of vertigo and was immediately given treatment similar to that mentioned above. He refuses to have salvarasan given him, and will not permit a lumbar puncture. He has steadfastly denied a luetic history.

The vestibular branch of the eighth nerve may be early involved in cerebrospinal syphilis, and this case is an example of the early diagnosis of that condition by these special tests.

CASE II. J. F., male, aged thirty-two. Was referred October 20, 1921. He gave a history of frequent attacks of vertigo over a period of six weeks. When perfectly quiet and with his head at rest he experienced no dizziness, but any sudden change of the position of the head would cause distressing vertigo, so that he could not carry on his occupation of ice dealer. Both turning tests and douching demonstrated an impaired function in the right labyrinth. The left labyrinth was found to react normally in all respects. A diagnosis of toxic labyrinthitis was made. Examination revealed as the most probable cause of this disturbance several infected and carious teeth, especially two or three in his left upper jaw. The patient did not take kindly to the suggestion that he have his teeth cared for, and was not seen for about three months. He returned to inform me that a few weeks after his last visit he had broken two of his upper teeth and was forced to have their stumps extracted. His vertigo left him almost immediately after the removal of these roots and he had felt perfectly well since.

Case III will appear in the author's reprints.

A Survey and Interpretation of the Spastic Phenomena of the Gastroenteric Tract

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Stockton (1), discussing the spasms of the esophagus, classified them as to duration: those that are temporary or transient, and those that are persistent and progressive. As it is my intention to survey the entire gastrointestinal tract with a view to presenting its spastic phenomena in terms of the symptomatology of the diverse maladies from which they are derived, I believe that a classification based on location will be more suitable for this paper. The spasms of the gastrointestinal tract, then, will be discussed in their anatomical order, downward, namely: cardiospasm, gastrospasm, pylorospasm, duodenal spasm, and enterospasm.

A brief, preliminary review of the nervous mechanism of the primæ viæ is essential. The innervation of the esophagus is derived from the vagus and from the sympathetic. The stomach is likewise innervated by the cerebrospinal system, and the sympathetic; with the former through the medium of the vagi; with the latter by the splanchnics through the solar plexus. The nerve supply of the intestines differs, however, as it consists mainly of nerves from the sympathetic system with a few filaments from the vagus, and in addition of an autonomic system comprised of the ganglia of Auerbach and Meissner —those of Auerbach residing between the muscular coats, and those of Meissner in the submucosa; and both belonging to the sympathetic system (2).

Reverting to the esophagus, it is worth mentioning the fact that normally the esophagus has five points of constriction, namely: at the introitus, at the aortic arch, at the crossing of the left bronchus, at the hiatus esophagi, and finally, at the cardiac opening (3). The entire epicardia, that is, the portion of the esophagus below the diaphragm, is distinctly narrower than the rest of the esophagus.

When the presenting symptom is dysphagia the question arises whether we have a spastic manifestation due to a neurosis, or a symptom of structural pathology. If the former, we should usually have as an accompanying symptom a complaint of substernal soreness brought about by certain articles of food which adhere, when swallowed, to the interior of the esophageal wall. A history of long duration would complete the triad of symptoms of an esophageal neurosis.

This form of malady, if allowed to persist, may be the precursor of the much more serious structural pathology of cardiospasm, socalled because the contraction is at the terminal end of the esophagus. This phase of the spastic phenomena furnishes a noteworthy instance of a structural change brought about by overactivity. The mechanical influences which obtain here are not unlike those of a cardiac lesion. In the mechanism of the latter a marked hypertrophy is attended with a secondary dilatation which soon predominates over the hypertrophy. In the cardiospasm a marked dilatation of the esophagus is associated with an unusually strong constriction of the cardiac sphincter and hypertrophy of unusual degree and long duration. Apropos of this I cannot forget the words of James Anders: "In obedience to the laws of nature, over use of any single group of muscles, while productive of marked hypertrophy in the first instance, is followed eventually by atrophy and loss of power."

A distinction has been drawn by Smithies (4) between cardiospasm and spasm at the cardia. Only the former affection includes hypertrophy at the cardiac sphincter with general diffuse dilatation of the esophagus. The spasm at the cardia is but a transient spasm with no accompanying dilatation; unless it be of such duration and persistence as to produce esophageal changes not of a transient character. At this point, it has ceased to be a spasm at the cardia, but has developed into a cardiospasm.

Fluoroscopically, these conditions are differentiated by recourse to the administration of such antispasmodics as belladonna, atropine sulphate, benzyl benzoate, to the point of physiological response, to which cardiospasm does not yield.

Spasm at the cardia may be induced by psychic storms and is therefore prevalent in individuals of the hypersensitive type. An approximation to the nervous status of the patient can be obtained by the method devised by Emanuel Libman, consisting of making firm pressure over the processes of both temporal bones simultaneously. In the hypersensitive individual one can elicit a marked reaction in the form of a contraction of the facial muscles, significant of pain; while in the hyposensitive patient this response is hardly noticeable. Thus we see that the etiological factors concerned in inducing spasm at the cardia may produce a more intense response when operating upon the type of individual that is neurologically excessive in reaction. As cardiospasm is a distinctly anatomical condition, in ascertaining the sensory status of the patient there is not elicited any expression of pain, unless there be also associated a state of psychoasthenia.

Smithies (4) points out that where liquid foods are quicker to provoke distress than are solids, a type of dysphagia is presented, which is a fairly characteristic diagnostic sign of cardiospasm. The tendency among practitioners to prescribe a liquid diet in such cases has not infrequently led the patient to express a preference for solids because they are better borne. In this respect this type of dysphagia differs strikingly from that common to various forms of anatomical stenosis (ulcer, cancer, trauma, etc.) along the course of the esophagus.

It may here be well to refer to the röntgenological signs of the pathological conditions of the esophagus, varying from an indication of a mere hesitation or delay of the opaque meal at the cardia to a total stoppage. The radiographic shadow appears as a regularly conical obstruction at or near the cardia, with a secondary dilatation above it. Though quite different this must be distinguished from the shadowgraph seen in a carcinoma of the lower esophagus. Here, stenosis is not limited to the hiatus esophagi, but almost always ascends above the diaphragmatic orifice; and usually, the lower end of the barium shadow "tails out irregularly." Moreover, cardiospasm and malignancy at the cardia can be further differentiated röntgenologically by the following sign complex of the latter: 1, delayed esophageal evacuation; 2, distortion of the gas bubble; 3, distortion of the cardia, and 4, elevation of the left diaphragm. Dilatation is conspicuously absent in malignancy, except for a slight dilatation above the point of constriction. It is syphilis, and more particularly cardiospasm, that gives a markedly dilated esophagus.

We will now pass to a consideration of the various spastic phenomena observed in both functional and organic disturbances of the stomach. The phenomena collectively spoken of as a gastrospasm differ vastly in their behavior, depending upon whether the underlying factor is functional or organic, extrinsic or intrinsic.

The stomach has been properly alluded to as the playground of spasm and excitement, and is the site of conflict whether the disturbing factor be endogenous or exogenous. It is not a static organ passive in vocation—a mere chemical retort—but a functionating dynamic apparatus sensitized to respond to stimulus from any source. To emphasize this diversity of sources Heyd (5) summarized a hundred cases. In twenty per cent. the etiological and provoking factors were in the form of organic disease of the stomach; in forty per cent. the lesion was within the abdomen, but remote from the stomach, and in the remaining forty per cent. the pathological process resided entirely without the abdominal cavity.

A principal source of external irritation provocative of gastrospasm lies in the nervous mechanism of the vagus and the sympathetic, together with their relay stations. If for some reason the vagotonic group be disturbed, any one of a diversity of conditions may arise (6): cardiospasm, pylorospasm, vomitus nervosa, regurgitation, hyperchlorhydria, hypersecretion, bulimia. Likewise, in accord with its function, a disturbed sympatheticotonia results in diminished activity of the gastric functions, inducing such conditions as incontinence of the cardia and pylorus, atony of the stomach, and diminished secretion—in short, a quiescent, fatigued stomach—the whole picture spelling passivity.

Not so apparent, but none the less persistent in its influence on the gastrointestinal nervous apparatus, is the effect engendered by disturbance of the endocrine glands. In his study of endocrinology, Garretson (7) declares with emphasis that the sympathetic of the vegetative nervous system is activated and maintained in balance by adrenalin, the hormone of the suprarenals; while the autonomic portion is dominated by the posterior lobe of the pituitary gland. It follows that a state of hypoadrenia or suprarenal insufficiency with its attendant manifestations, such as low blood pressure and impoverished sympathetic tone, allows of the unimpeded action of the vagus, which, unrestricted, inaugurates a condition of vagotonia with its sequelæ—hyperchlorhydria and hypersecretion. On the other hand, hyperfunction of the suprarenal glands is productive of sympathicotonia, in which a reverse clinical picture is observed. Garretson also singles out for attention that hypopituitarism produces a lowered vagal tone with resulting sympathicotonia, while hyperpituitarism creates vagotonia. Does it not become apparent that the therapeutic indications in the treatment of gastrointestinal functional conditions may largely depend upon the deduction that gastric symptoms arising from certain endocrine disturbances may yield to attempts to induce a compensatory stress reaction of the thyroid, which would take off the load from the overactive pituitary? Or, from the viewpoint of drug therapy it therefore materially differs whether we will administer atropine to paralyze the vagus so as to cause a cessation of gastric secretion; or give adrenalin to stimulate the sympatheticus so as to inhibit the gastric flow.

A case in point is that of S. G., aged forty-five, weighing 192 pounds, presenting these symptoms of vagotonia: persistent systolic pressure of 110, increased salivary secretion, slow pulse, thus a hypoadrenia with its attendant hypotension and hyperchlorhydria; free hydrochloric acid 50, total acidity 90. Under the administration of suprarenal extract, the symptoms disappeared and the blood pressure rose to 120, and gastric analysis showed a lowered gastric titre.

Kaplan (8) asserts that "too meagre a supply of adrenalin secretion permits the hydrochloric acid to be formed in pathological quantities," and cites two cases where suprarenal extract administered in small doses showed in one case, as a result of one month's treatment a reduction of total acidity from 108/40 to 88, and of free hydrochloric acid from 78/40 to 46; in the other case, after six weeks' treatment, a reduction in total acidity from 142/40 to 98, and in free hydrochloric acid from 86/40 to 50.

In interpreting symptoms that arise from gastrointestinal disturbances, Meltzer's (9) law of contrary innervation presents an acceptable explanation of some of the spastic phenomena, and may therefore be applied with advantage. The law, in brief, is based on a physiological phenomenon, by which a viscus is innervated by two antagonistic sets of fibres, namely those of inhibition and those of contraction, working simultaneously. Meltzer applies it in defining intestinal and gastric colic. He states that if the caudal end of the viscus remains contracted while the cephalic muscular fibres are contracting and progressing forward, there results a progressive diminution in the volume of the viscus between the points of contraction, without any reduction of contents, thereby producing extreme tension and the sensation of colicky pain.

Also in the case of the gallbladder, a disturbed innervation which fails to relax Oddie's muscle while the gallbladder is contracting, results in biliary colic and stasis. And pylorospasm may ensue through failure of the neutralization of the acid chyme by the alkaline bile.

An indispensable aid in the diagnosis of spastic phenomena of the digestive tube is the röntgenological study of the passage of an opaque meal. A word of caution here may be timely. Spasm of any sort, whether it be remote from its source or of intrinsic causation, vanishes under the influence of deep narcosis. It is therefore advisable when confronted with such spastic manifestations as the incisura, or hour glass contraction or pylorospasm, to administer an antispasmodic to the point of physiological action, and thereby produce relaxation. Failure of the spasm to relax would indicate an intrinsic cause, such as a gastric ulcer, and its shadowgraph record would serve to remove any doubt that may arise because of the disappearance of the spasm through narcosis.

Interpretation of the röntgenological findings must be dominated by a sense of fitness. By way of illustration of what I mean, let us assume that the patient is of the apoplectic habitus, that is, the hyperesthenic type. A röntgenological confirmation would lie in finding a stomach of the hyperesthenic type, rapidly active antrum, good tone, and active or hyperperistalsis. If, however, the stomach should prove to be of the atonic type, with delayed evacuation, delayed peristalsis, then we must assume a pathological condition. On the other hand, the atonic type of stomach is normal in the asthenic habitus.

It almost goes without saying that in the study of spastic phenomena, the x ray findings are not sufficient by themselves, but must be supplemented by and interpreted in the light of accompanying clinical and laboratory tests. For instance, from our laboratory data we know that ulcus is a weeping disease in contrast to malignancy, which is dry. The corresponding symptom complex under x ray is hypersecretion, hyperperistalsis, with gastrospasm as a standing phenomenon. In the case of malignancy the symptom complex under x ray is analogically the reverse: presenting diminished secretion, diminished peristalsis of the uninvolved part, with absence of peristalsis at the site of infiltration—in short, a quiescent stomach. But where, for example, the malignancy has infiltrated the stomach wall, the röntgenograph, in failing to disclose a filling defect, tends to mislead, unless checked and interpreted by clinical study.

We know that the factors concerned in carrying on the normal pyloric patency, which is intermittent, are the interplay of the acid chyme and the alkaline secretions of the duodenum. The pylorus is opened by the action of the acid chyme upon the mucous membrane lying proximal to it, and is closed when the alkaline secretion of the duodenum mixes with the acid chyme and effects its neutralization. When the pylorus is thrown into a state of spasm and closure—a condition termed pylorospasm—an enforced retention of the irritative acid chyme, combined with the prevention of ingress of the protective bile, tends to increase gastric irritation. It is obvious that the cardinal symptom of pylorospasm, one may well say its *sine qua non,* is the retention of food within the stomach seven hours after a meal.

The etiology of pylorospasm is not solely functional, as might perhaps be gleaned at first impression, but may be also organic. Spastic disturbance is evoked by such disorders as hyperchlorhydria of the vagal type, or again, by ulcer or adhesions to adjacent viscera.

Sippy declares that pylorospasm is largely due to hyperchlorhydria, and quotes by way of proof, that by proper neutralization of the gastric juice pylorospasm and pyloric stenosis were relieved in about eighty-five per cent. of the cases of ulcer. Pyloric stenosis diagnostically differs from pylorospasm in that the evacuation of water is usually protracted in the first condition and normal in the other. Elsner (10) emphasizes the observation that "intermittent hyperchlorhydria without ulcer may cause pyloric spasm and temporary obstruction."

Wayne Babcock (11) explains the gastric symptoms associated with pylorospasm so often noted in disease of the appendix, by the ileopyloric reflex, which, by guarding against overdistention of the small intestine just as the block system of our railroads prevents dangerous traffic congestion, maintains pyloric closure until the distended block below, ending with the ileum, has emptied through the ileocecal valve.

Radiographically, pylorospasm is manifested by a sharply cut off pylorus, total or partial retention of the motor meal, a deep cutting peristalsis of the 6-8 cycle type with its activity confined to the pyloric region, a transient hour glass contraction and finally, occasional deep incisura at the pylorus. This last manifestation must not be confused with the normal incisura at the pars pylorica and pars cardica, which, of course, are not spastic manifestations.

Because pylorospasm brings its sensation of pain in the right lower quadrant, the pain centre of so many other ills, it is a dangerous diagnostic sign. Heyd says "The pyloric syndrome of chronic appendicitis are symptoms due to pylorospasm associated with hyperacidity and hypersecretion of the stomach." Moynihan reminds us that the most frequent site for the production of the symptoms of ulcer of the stomach is the right lower quadrant. Yet withal, we estimate that the sign complexes made up of indirect manifestations are of great value. And, beyond doubt, a thorough analysis of the spastic phenomena in many cases of locomotor ataxia would preclude the possibilities of such mistaken diagnosis as abdominal condition, and prevent unnecessary surgical intervention.

I cannot let this opportunity go by without at least a passing reference to the law of average localization. I believe that this socalled law is of doubtful aid in diagnosis and that its use should therefore be circumspect. It is based upon an assumption that as the brain is possessed of a proper sense of direction, it therefore learns to localize sensations in the organism in which they arise. This law does not well apply to tabes, with its seat of trouble in the spinal cord, yet expressing its existence through gastric crises occurring irregularly, with intervening periods of health. Thus, with a periodicity such as is observed in gastric ulcer, with intense pain, vomiting, sitophobia—we have an ulcus syndrome staring in the examiner's face. Is it surprising that with such a clinical picture, the first impression should be not of a lesion remote from the primæ viæ, but of a gastric malady, most commonly an ulcus? And if the physician attach diagnostic value to the socalled law and be guided by his patient, is it not likely to lead even to surgical intervention? The patient is endowed with a gastroenterostomy—insult is added to injury. Rather, how much better it is to include in the routine examination, a search for neurological signs such as are furnished by a Romberg sign, diminished or absent knee jerk, or an Argyll Robertson pupil, also a serological study for Wassermann reaction, or reactions, for often one does not suffice! One recalls with pain a peritoneal incision for the abdominal reflex in lobar pneumonia; or a recommendation of a gastroenterostomy for a tuberculous disease, or syphilitic gastric ulcer!

Many writers regard the first portion of the duodenum—the duodenal cap—as a mere continuation of the pylorus, because of the smooth and unbroken continuity of outline of mucous membrane, and the absence of any valvulæ conniventes, the socalled winking valves of the small intestine. However, for the purpose of this article I shall maintain the distinction.

Cases of spastic duodenal irritation, apart from those with an organic background, are reflex in their origin. They may be brought about by a diseased appendix, incomplete ileocecal valve, mucous colic and gallbladder pathology. The shadowgraph picture will be that of hypermotility, hypersecretion, pyloric insufficiency, spasm (contracture of the greater curvature), a possible residue in the bulbus duodeni and in the pylorus. Carmen stresses the combination of hyperperistalsis, with gastric retention and a normal gastric outline, as diagnostic of duodenal ulcer with stenosis.

As regards enterospasm and its relation to digestive upsets, it is well to recall that the digestive functions are influenced by the coordination of the vagus and sympathetic nervous impulses and of those of the central nervous system, through an intermingling of fibres from the medulla with the sympathetic and ganglionic cells situated in the muscles and glands of the primæ viæ. Therefore a proper functioning is dependent upon maintenance of equilibrium between the two forces, very much in the manner that a normal temperature is maintained by the proper balancing of the forces of the thermotoxic centres, namely: those of the thermogenic and those of the thermoinhibitory and thermolytic centres. When, however, there is an excess stimulation of one of the forces, there is brought about a condition of vagotonia, similar to that previously explained in our discussion of the upper portion of the digestive tube.

The important intestinal affections of the vagotonic group are enterospasm, spastic constipation and spasm of the anal sphincter (6). The affections of the sympatheticotonic group are of a reverse nature: diminished secretion, atonic constipation, relaxed anal sphincter. Enterospasm and spasm of the anal sphincter are prolific causes of spastic constipation. Hertz asserts that chronic appendicitis is one of the most common causes of enterospasm.

Peristaltic unrest or visible peristalsis is usually diagnostic of intestinal or pyloric obstruction. The phenomenon first described by Kussmaul occurs in nervous patients under emotional stress, and is more readily observable when the abdominal walls are thin. Taylor and Miller, referring to this telltale phenomenon, state that it requires close and patient observation, as it is quite easily overlooked.

CONCLUSIONS.

We have found that certain spastic phenomena are normally present in the primæ viæ and that pathological conditions may arise which convert such physiological spastic demeanor into a state of abnormal activity.

We have found that certain phases of pathology betray their presence by evoking spastic activity. It is therefore patent that the abnormal spasm has value as diagnostic of the pathological state. It is an irregularity that sets us on inquiry, a sign post, which when read aright, indicates the therapeutic road. And in as much as these spastic phenomena owe their manifestations to some form of nerve excitation, due regard must be had for the personal equation—the nervous status—of the patient when seeking to establish the pathological basis.

It is well to remember that these spastic phenomena have a sort of inherent capacity for deception, as when they disappear in deep narcosis. It is therefore best to refuse to accept a negative x ray finding as a conclusion, unless fortified by clinical history and laboratory findings. "Absence of proof," says Koch, speaking of tuberculosis, "is no proof of absence." One must also beware of the pitfalls of socalled clinical mimicry.

There are divers maladies both within and without the gastroenteric tract which evoke it into spasm. This suggests that the search for the etiological factors must extend to all likely regions, not omitting the endocrines. It is confirmatory of the seemingly paradoxical maxim that the field of the specialist does not lie entirely within the confines of his specialty; that as a gastroenterologist he cannot view a case with a tubular vision narrowed to the limits of his special field of activity, and studiedly disregard conditions that do not happen to lie within it.

Finally, it is well to remember that in organs related anatomically, the manifestation of spasm in a viscus may be reflex, and that the true offender is elsewhere. Where surgical intervention is indicated, this reminder is doubly necessary. Let us bear in mind that exhaustive preoperative study minimizes postoperative digestive invalids, and such diagnoses as anxiety neuroses and postoperative adhesions.

The author's references will appear in his reprints.

Once a Cæsarean Always a Cæsarean?

By J. THOMPSON SCHELL, M.D.,
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This brief report is presented to express disapproval of the dictum stated in the title. There seems to be a popular belief that if a patient is once subjected to a Cæsarean operation it must necessarily follow that her subsequent deliveries must also be by the Cæsarean route.

My experience embraces 167 Cæsarean operations for various indications and I desire to report two cases in which each patient has had three normal deliveries since operation, two cases with two normal deliveries, and nine cases in which each patient has been delivered of one child each, all of these cases being spontaneous births.

In addition to this, my records show fourteen other cases in which delivery was by the vaginal route with the assistance of forceps, and one case by podalic version, making in all thirty-four babies that have been delivered by the vaginal route in women who have previously been subjected to Cæsarean section.

A number of the 167 women who were sectioned have been rendered sterile at the time of operation, at their request, although I wish to put myself on record as being opposed to this method as a routine procedure. Inasmuch as many of these patients were operated upon as referred cases, it is impossible to estimate how many other vaginal deliveries could be added to these already reported.

It is interesting to note, also, that there is no record of any case that has been followed by a rupture of the uterus. All of these operations have been of the conservative type with a small abdominal incision and a careful suturing of the uterus, with a total mortality in the 167 cases of two deaths. The patients have been operated upon without selection. The method of operation has never varied and many of them have been operated upon after forcep application has been first tried. In many of these cases there has been morbidity and a stormy convalescence but no deaths.

The two deaths reported were due, in one instance, to a placenta prævia infection, followed by general peritonitis and death; the second, to a cauliflower carcinoma involving and including the entire vaginal fundus. This patient became infected and died ten days after operation. One of this group was delivered by the Cæsarean route five times, one four times, two three times, four twice.

It is my opinion that Cæsarean operation of the conservative type is of small operative risk, that its usefulness will be more appreciated as time goes on, and that as a competitor for the high forcep delivery, it will, in the future, probably supersede the operation of forceps where the head is at the brim after the honest and prolonged test of labor has been made. In other words, a woman in labor for a prolonged period, say twenty-four hours, with the head still high up and presenting at the superior strait, but not engaged, it is my opinion that the conservative Cæsarean section is by far a better and safer operative procedure than the axis traction forcep delivery with its associated dangers to both mother and child.

2102 Spruce Street.

Historical Medicine

An Appreciation of the Work of Johannes Walæus

A Pioneer of Vivisection

By G. ARBOUR STEPHENS, M. D.,
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Johannes Walæus was professor of medicine at the University of Leyden about the middle of the seventeenth century. This celebrated old Dutch university was founded in 1575 by William of Orange and among those who were students in the days gone by we find the names of well known men, such as Goldsmith, Boswell, Evelyn, attracted thither by the reputation of its learned professors. To be elected to a staff that included such great names as Descartes, Grotius, Arminius, is indeed a high honor, and, although the name of Walæus is not well known, I venture to think that the following reference to his work cannot but tend to raise him towards the niche he so justly deserves.

At the end of a book, a translation of Bartholini's *Anatomy,* published in 1665 by Nicholas Culpeper, Gent. and Abdiah Cole, Doctor of Physick, it was my good fortune to come across

THE EPISTLES
of
JOHANNES WALÆUS
concerning the
MOTION OF THE
CHYLE
and the
BLOOD.
To Thomas Bartholinus
the son of
Caspar Bartholinus

Walæus gives us the reason for writing these epistles in his concluding remarks, as follows: "And thus (most worthy Friend Bartholine) I conceive I have answered your Question touching the motion of the Blood. Whereupon I did enquire more scupulously, that I might better know the Nature of the Humours, and their Deflux: from which Flux of Humours innumerable Diseases arise.

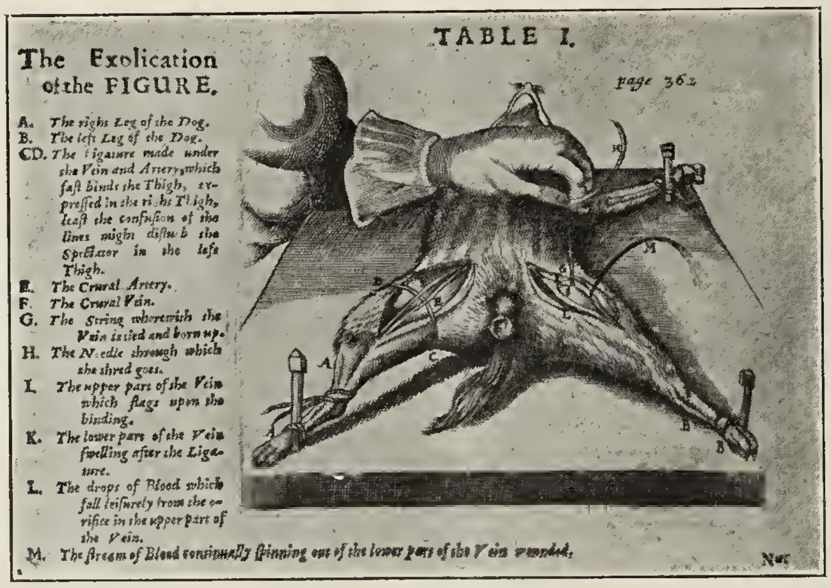

TABLE I.

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The Exolication of the FIGURE.

A. The right Leg of the Dog.
B. The left Leg of the Dog.
CD. The ligature made under the Vein and Artery, which faſt binds the Thigh, expreſſed in the right Thigh, leaſt the confuſion of the lines might diſturb the Spectator in the left Thigh.
E. The Crural Artery.
F. The Crural Vein.
G. The String wherewith the Vein is tied and born up.
H. The Needle through which the thred goes.
I. The upper part of the Vein which flags upon the binding.
K. The lower part of the Vein ſwelling after the Ligature.
L. The drops of Blood which fall leiſurely from the orifice in the upper part of the Vein.
M. The ſtream of Blood continually ſpinning out of the lower part of the Vein wounded.

Fig. 1.—Vivisection experiments on the dog demonstrating circulation of the blood.

"And the Experiments wherby I was brought unto this Opinion are so evident that I doubt not to affirm, that learned and discreet Physitians will henceforward allow of this Motion of the Chyle and of the Blood.

"Touching the truth of these Experiments you cannot (my Bartholine) make Question who have yourself seen many of them: and there were frequently present most learned Doctors of Physick and persons of solid Learning.

"And so farewell, most learned Bartholine, and persist to love me.

"Dated at Leyden, the 10 of the Kalends of October, Anno 1640."

Thus ended the first epistle, while at the end of the second we find these words: "These are the things (most excellent Bartholine) which I thought fit to joyn to the former, that I might satisfie those who cannot receive a new opinion, wherein they observe any difficulty or obscurity; who many times have neither minds nor time to enquire exactly into the bowels thereof. But in my judgement, we ought not to deny things manifest, although we cannot resolve such as are difficult."

"But I never was disposed to contend and quarrel with any man about words. There are very many excellent things about which time may be spent, which many times is not sufficient for our necessary occasions. Also from a Scoffer that seeks after her knowledge does hide herself away, but to him that is studious of the truth, she comes to meet and presents herself to his views. Farewell, most learned Bartholine. From the University of Leyden in Holland, the Kalends of December 1640."

It should be pointed out that these experiments were performed soon after the great Harvey had published his new and revolutionary theory, and at a time when opinions were disturbed to a tremendous extent throughout the medical world. Hot words were being handed about, and recriminations indulged in to make things very unpleasant, so that the delightfully charming manner in which Walæus writes to his beloved friend Bartholine at Copenhagen is all the more remarkable.

These epistles are written apparently after many pressing requests, for he says: "Howbeit you continue your Requests and I am much ashamed alwaies to deny you." His hesitation to reply is due, as he points out, to the fact that "No man can publish in Print which some account excellent, but he presently meets with a Detractor who will cut and tear him most cruelly. Now, for a man to seek nothing else by his Cares and labours, but Envie and Vexation of Mind is extreme madness."

Having at last pulled himself together he sets out in right earnest to give Bartholine a full and clear account of the motion of the blood, supported by his own personal experiments on the living animal. He first of all puts the question, "What blood it is which is moved?" and answers it by saying, "When we have taken Blood out of the greater Arteries, and from the same Creature have taken some out of the

Veins, and have let them both grow cold and congeal, we could never observe any difference betwixt them. So that we can see no other but that the Arterial Blood is of the same kind as the Venal." The conclusion he arrives at is that there is need to inquire into the motion of only one sort of blood. This motion, he points out, is not a to and fro motion or "an up and down motion in the Vessels like boyled water" as some of his contemporaries suggest, but "that the Blood is moved from one part of an Artery or Vein into another is a thing very manifest. For Blood is contained in the Veins of the furthest parts of the Body, which seeing it is not bred there, it must needs come from some other place."

Walæus is nothing if not thorough, for he points out that in order to understand thoroughly the whole motion of the Blood, "our best way will be to begin at the very Fountain and Original thereof." To do this he starts with the Chyle and shows that the meat eaten is closely embraced by the Stomach and "moistened with the moisture of the Stomach." "It is cut and minced by an acid humour . . . which comes from the Spleen."

After the food has been properly digested it is converted into Chyle, where he says it is "of an ash color, and presently from the Duodenum it begins to enter the milkie veins of Asellius." In order to prove that the milky juice does not get into the lacteals from anywhere else than the gut, he performs a vivisection experiment as follows: "I have bound these milkie veins inserted into the body of the Guts, and observed that from the cavity of the Guts to the ligature they are evidently full and swoln, but from the ligature to the Mesentery they wax empty and fall in." The chyme, he tells us, "is mixed with the Blood in the Ramus mesentericus, in the Vena portæ and in the very liver also itself." Although he knows that the ultimate branches of the vena porta do not join up to those of the vena cava, yet he is quite convinced that blood mixed with chyle does transfuse, and then passes out of these latter into the vena cava itself, for "When in live anatomies it is tied above the liver, it manifestly swells with Blood flowing in."

He then tells us that the blood passes out of the vena cava into the heart, and out of the right ventricle of the heart into the "Vena arteriosa, but not through the septum of the Heart," "for I find no open passages in this place; although Gossendus had seen Payanus shew the Partition of the Heart to be transpassable by sundry crooked and turning passages . . . and the truth is I have divers times found it to succeed as he saies; but I have withall observed that those waies and turning passages were not all made by Nature, but by the Probe or point of a Penknife."

It is very difficult to believe that there were physicians who could stoop to such deception in connecion with an investigation connected with the heart, upon which investigation treatment would eventually have to be based. Such characters, however, were n evidence in those days, for Walæus tells us that "learned men have in no Age more ambitiously striven who should seem most learned than at the present time. And to attain their very desire very many are not afraid to assist themselves by Calumnies and other worse Arts."

He gives details as to how the blood passes into the lungs, thence to the left side of the heart, the aorta, and the rest of the small arteries. The capillaries he does not seem to know as such, for he had no microscope, but he tells us that "the blood out of the small Arteries may enter into the Veins, for the Arteries have a way open into the veins by the common mouths of one opened into another." He emphasizes his point by quoting Galen to the effect that, if a large artery be opened, one may draw all the blood in its body out through the said arteries, but to make it quite conclusive Walæus performs one of his innumerable vivisection experiments.

The accompanying diagram gives us an excellent idea of the way in which he carried out the operation to show "that the Blood did not come downwards from the greater Vessels but upwards, out of the smaller Vessels into the greater."

After having demonstrated the completion of the circulatory circuit via the large veins into the vena cava and back to the heart he raises the question, "how much comes from the Heart at every pulse" and proceeds to tell us that we cannot determine it exactly, but "this I can witness, that out of the Heart of a Rabbit there hath come at every pulse half a dram of blood, and out of the Heart of a great Water spaniel half an ounce; yet I conceive more comes out when a live Creature is Dissected than when it is in Health. And if a man would determine by conjecture from what we have seen how much may come out of the Heart of a Man in health at every pulse, I shall not be against those who say half an ounce of Blood is shed into the Arteria aorta." This estimate compares favorably with our most modern one, but whereas his was done soon after Harvey's discovery, ours had all the advantages of careful thought about the subject.

To Walæus it is a matter of great surprise that this circular motion of the blood was not discovered before Harvey made his appearance, for he tells us, "Truly I cannot sufficiently wonder, that in so many Ages past, this motion of the Blood hath been unknown, seeing I find sundry and those no small intimations thereof in the ancient Writers." He points out that Hippocrates in his book *de Victus ratione* attributes these circular motions to our "Heat and Humours whereby they are moved inwards and outwards." In another book of Hippocrates, *de Os . . . Natura,* we are told that, "The Veins being spread through the Body, do cause a fluxion and motion, sending many branches from one. For it keeps in a circular course so that you can find no beginning." Another author from whom he quotes is Diogones Appolloniata, wherein he finds "The most thick Blood is suckt by the fleshy parts and that which redounds into the greater Veins becomes thin, hot and froathy." Plato and Aristotle are also brought in to show how near the ancients were to a sound solution of the problem, the latter stating "that the Heat of every Animal when it comes aloft, it soon after circulates and descends again."

After these ancient writers there seems to have been no work done in connection with the subject, even Galen for whom he apologizes, "not being able to reform all things, and the latter Greeks, Arabians and Latins have too close followed him," evidently being content with accepting things from those in authority rather than adopting methods similar to those of St. Paul of proving all things, or of praying for all those in authority! Is there not too great a tendency these days to rely on authority rather than to think things out for oneself? Far better it seems to me to come under the castigating hand of Walæus for trying to support a false theory by worse experiment than to accept anything or everything that is offered to us. The great aim of vivisection is to make each man think for himself, and any socalled medical education which tends to make medical men diagnose by rule of thumb deserves to be censured most severely.

It was by observation that Paulus Servita, the Venetian, discovered the structure and use of the values in the veins, and as Walæus tells us, "The most learned William Harvey, being taught by the aforesaid Paulus Servita, did more accurately search into this motion of the Blood, augmented the same with inventions of his own, proved it strongly and published it to the world in his own name. Such," he adds, "hath been the invention and such the fate of this motion of the Blood." Walæus raises the question as to "how soon the Blood performs the Circuit from the Heart to the Heart again" and has to admit the difficulty of determining this precisely, but says, "We observe that it is done sooner by an Anastomosis nearer the Heart, than by one off." He adds, "Howbeit, it goeth not so swiftly as we see it leap out when a Vein or an Artery is opened, because then it is moved into the free and open Air: but within the Body it is compressed to lift up the Vessels, and to thrust on the foregoing blood."

In connection with the subject of fevers Walæus tries to explain why they are not always "alike fierce" and comes very near to the modern explanation of malarial fever when he says "because it doth not cause a Paroxism till it have attained a certain degree of putrefaction; and that the Fit lasts so long till that putrid matter be evacuated." Had he but had a good microscope, what discoveries he would have made! "But," he tells us, "it is now time to enquire into the Causes of these motions" and proceeds to point out "either it must be moved by an inbred virtue or faculty, or by some motion which must be referred to carrying, drawing, or thrusting." That it does not move of itself he proves by pointing to the fact that blood drawn into a basin shows no spontaneous movements whatever. Nor will he admit that it is moved by the spirits, for "they by their lightness should move the blood upwards, which we see here to be moved downwards and sidewaies."

Some had put forward the argument that the blood is driven from the heart by a certain heat causing rarefaction of the blood which then "requires greater space and therefore dilates and lifts up the Heart." This explanation was not a foolish theory but had for its support the fact that the heart of an eel when it ceases to pulse, if it be warmed, starts to pulse again. Walæus admits this experiment but shows that "when the Guts and Muscles are heated in a live Dissection, in which there is no ebullition, the motion seems to be restored," and realizes that heat is only a mere stimulant. There are other stimulants to the heart muscle of which he is aware, such as "a prick with a Penknife or a Pin," and Walæus considers that a change in the constitution of the blood acts as a stimulant also, and here he is quite right.

We now come to a point that is of very great interest to us these days when so much is said of sinoauricular nodes, fibrillation, flutter and heart block, for Walæus, according to this epistle, seems to have anticipated all these things. He tells us "that the Blood is driven by the Vena Cava into the right Earlet of the Heart, I have manifestly seen in the dissection of live creatures; for in all motion of the Heart, the first beginning of Motion is so or no, because the Cava was knit to the Earlet and the Heart. We cut the heart and the earlet quite off in living dogs at the Vena Cava and we observed that even then the Vena Cava did a little pulse and at every time did send forth a little Blood. And therefore the Vena Cava hath certain fleshy fibres for the most part near the heart, which elsewhere you shall not find in the Vena Cava. Now the motion of the Vena Cava is most evident near the Heart."

Compare the above which was written in 1640 with the following quotation from Lewis's *Clinical Disorders of the Heart Beat,* written in 1913:

"The complete beat of the normal heart consists of a contraction of its chambers in an orderly sequence. The wave of contraction starts in a small and newly discovered (sic) mass of tissue, the sinoauricular node which lies embedded in the upper and anterior end of the sulcus terminalis running from the junction of the right auricular appendix and the superior vena cava towards the inferior vena cava."

Sir James Mackenzie gives the credit for this discovery to Keith and Flack, being evidently quite oblivious of the work done by Walæus.

Walæus tells us that "in the Earlet the motion or constriction is a little sooner than it is the Heart but the impulse into both Earlets and into both the Ventricles happens at one and the same moment of time: Save in creatures ready to die in which we have observed that both Earlets and both Ventricles do not pulse at one and the same time."

In a paragraph on personal experiences, Sir James Mackenzie claims that "my attention was first directed to the condition of auricular fibrillation as a separate and definite entity about 1890," and proceeds to give Lewis's definition of that condition as follows: "The walls of the auricle stand in the diastolic position: systole, either partial or complete, is never accomplished; the wall as a whole is stationary, but careful examination of the muscle reveals an extremely active condition. It appears to be alive with movement; rapid, minute and constant twitchings or undulatory movements are observed in a multitude of small areas upon its surface."

Let us hear what Walæus had to say in 1640 on the same subject. "But when the Blood is thus driven into the Ventricles of the Heart, the Heart hath no motion evident to the Eye, but putting our Finger upon the Heart, we perceive somewhat to enter into the heart and that the Heart becomes fuller which also Harvey hath observed in his fourth chapter. Yea we have observed that the Earlet hath pulsed seventy, sometimes an hundred pulses before any motion of the Heart followed."

One cannot refrain from exclaiming as did the preacher a few thousand years ago: "that there is nothing new under the sun."

If Walæus had been in a position to use electricity as a stimulus in some of his experiments, his contributions to medical science would have been still greater, for even without it his work is quite up to date in its suggestiveness. Take for example the following paragraph: "In the Particles of a live heart dissected and taken out of the Bodie, where constriction has ceased, there remains a seeing kind of Palpitation but that is another kind of motion proceeding from the spirit contained in the flesh and seeking its way out; such as may also frequently be seen in the muscles whole or dissected in Creatures dissected presently upon their death."

It were well for some modern experimenters to note the above and realize that all motion of the heart muscle is not the same motion.

Walæus must have been a hard and diligent worker, for the number of experiments he seems to have performed on living animals of various kinds is enormous.

Among those he mentions in the course of these epistles are dogs, rabbits, cats, monkeys, while he dissected large animals including one whale in order to satisfy himself as to the anatomy of the heart and to show that Aristotle's statement in *de partibus* that "the greater sort of Animals have three ventricles in their Heart. For the greatest Animals that are have but two Ventricles as I observed in the Dissection of a young Whale."

Had he but known the value of asepsis, the surgery of the heart would have been a matter of ancient history by now, for the numerous experiments he performed successfully in connection with that organ and its big vessels are worthy of being considered as masterpieces.

As a vivisector he must be considered a prominent pioneer though he himself gives credit to Galen for having done some experimental work on living animals in connection with the arteries.

When treating of the veins, Walæus makes one interesting suggestion which if true must be considered as of great importance. He says "In the Vena Cava, there is a certain Storehouse of Blood wherein blood is treasured up for future uses, when it is more plentiful then that all of it need be sent into the Heart."

As Walæus wrote to Bartholine "also from a Scoffer that seeks after her knowledge does hide herself away, but to him that is studious of the truth she comes to meet and presents herself to his view," so it might almost be said that Solomon wrote in anticipation of Walæus. "I wisdom I dwell with prudence and find out knowledge of witty inventions."

Leonardo da Vinci as a Scientist.—Dr. John C. Hemmeter (*Annals of Medical History,* March, 1921) gives us, in this full and very interesting article, in addition to other data on the life and work of da Vinci, an outline of the history of anatomy up to the time of the great man. He tells us that the status of anatomy in the Middle Ages was deplorable. The medieval doctor owed his scant scientific knowledge to the Arabs, and they were forbidden by their religion to open cadavers. In the Occident also the opening of cadavers was also for long periods forbidden, but not altogether, during the Middle Ages. "Mondino de' Luzzi of Bologna (1326), whose book on anatomy, copied in part literally from the canon of Avicenna, an Arabic physician (980-1036), was in almost exclusive use in all the medical schools of Italy for more than two hundred years, mentions as something quite remarkable that he had dissected three cadavers."

So Leonardo was entirely without sources for the study and representation of the human form, but he resolved to acquire information. He found a congenial spirit in these researches in Marco Antonio della Torre, the founder of a medical school at Pisa, who was willing to apprentice himself to nature and dissect cadavers. From these Leonardo made a series of magnificent anatomical drawings, which remain as a perpetual monument to these two originators of illustrative anatomy. The original file of these was lost until the eighteenth century, when it was discovered by Dalton, librarian of George III, in a closet in Kensington Palace together with some sketches by Holbein. The volume contains 779 drawings, incuding illustrations in optics, and of bones, muscles, bloodvessels, viscera, brain, eye, ear, and other organs and portions of the human body, all executed with the utmost fidelity to nature. These drawings, it is stated, surpass in some respects the famous illustrations in Vesalius's anatomy, so long ascribed to Titian. J. Hunter, the most eminent anatomist and physiologist of the eighteenth century, declared that da Vinci was the best anatomist and physiologist of his time; Knox, a famous English anatomist, stated that his drawings of the valves of the heart, and especially of the semilunar valves of the aorta and of their varying positions, could be founded only on a correct conception of their functions. Hence it has been assumed that Leonardo may have known of the circulation of the blood a hundred years before Harvey.

The great artist did not content himself with a knowledge of the defunct body, but extended his investigations to include the physiologic functions of several of the organs. The results of these researches are recorded in part in his treatise on painting, in which he discusses the relative conditions of the body at rest and also of its movements, both voluntary and involuntary. "He begins with the flexions and extensions of the several members, and explains walking quite in the sense of modern physiology, as a constant falling forwards. Then he expatiates on the influence of occupations on the carriage of man in explaining which muscles are active in lifting, in carrying, in supporting a load, in raising an arm for throwing or for swinging a club, and how the body remains in equilibrium in the positions variously conditioned by these muscular activities. Leonardo might well have been the first to institute investigations on the statics and mechanics of the human body. . . . To grasp correctly the involuntary movements, such as are expressive of pain, of joy, of fright and of other emotions, he advises the young artist to mingle with the common people, among whom the emotions are revealed unrestrained in the facial expression and in the gesture."

Editorial Articles

INDUSTRIAL HYGIENE

In humorous vein a writer in *Scribner's* Point of View insists that man is having health thrust upon him at such a rate that he will soon be bereft of all the pleasures of invalidism and robbed of those finer qualities of character which Hamerton and others have pointed out as begot only of ill health and unknown to the always rugged and robust. Man, in the more primitive state, however, is very resistant to that which goes against custom and personal habit, and it is not likely that the need for hospitals and medical men will be dispensed with at once. Students of industrial hygiene find their subjects especially uninterested in health or in securing such conditions as make health in their industry possible. They are vastly more interested in trying to get a small increase in wages than in having improved conditions in factory or mine.

During the recent anthracite strike a number of open letters appeared in the daily papers affirming and denying that coal mining was an unhealthy occupation. A physician engaged in industrial work recently interviewed a president of one of the local unions in the anthracite district, and was told that "there isn't any more miner's asthma than among other people. There's just as much miner's asthma among women as among men." Another president of a local union said, "Miners are as healthy as other people. Why, there isn't more than ten per cent. of them has asthma." It was suggested that ten per cent. was a large proportion, but the suggestion made little impression.

So far as this industry is concerned it has long been remarked that deaths from tuberculosis (according to the death certificates) are few as compared with the population at large, about five per cent. as compared with twenty-five per cent. for all occupied males. Even making allowance for the high death rate from accidents, the rate for tuberculosis still remains significantly low. However, the amount of sickness, disability, and death from other respiratory diseases probably vastly more than makes up for the relative freedom from tuberculosis, and, while anthracosis and miner's asthma may not be so frequent or in such aggravated form as when mines were less well ventilated, there is still much that needs to be done in the way of preventive measures against these dust and fume diseases. The whole subject has been much neglected and a study of the matter has recently been taken up by the Public Health Service. They will meet with difficulties in their endeavors to get at the facts of the matter, but we shall look forward with great interest to the outcome of their investigations.

THE USE OF INSULIN BY THE GENERAL PRACTITIONER

It may be stated quite definitely that the use of insulin for controlling diabetes is a conspicuous success. It has its distinct limitations; that is, it is not a cure, but these limitations are fairly well known and, considered from most aspects, the production of insulin is an epoch making event and one which, moreover, seems to point the way to other discoveries of a more or less similar nature. The therapeutic value of insulin is so great and the prevalence of diabetes is so wide that the remedy should be within the reach of all classes of society. Unfortunately the cost is a very considerable obstacle to its general employment. On the other hand, the condition occurs most frequently among the prosperous and well fed—it is held by some to be a disease mainly due to overeating—who can afford to pay for the treatment.

The next points are that an accurate diagnosis shall be made and that the treatment shall be carried out scientifically. Of course cases of diabetes come mostly within the province of the general practitioner and he has to teach himself how to diagnose correctly, at any rate, or the consequences in some cases may be disastrous.

At a meeting of the Section of Therapeutics and Pharmacology held in the house of the Royal Society of Medicine, London, on October 9th last, the use of insulin in general practice was discussed. Professor Hugh Maclean, in opening the discussion, said that the nonsuccessful cases were probably those unsuitable for treatment. If the doctor followed the directions carefully insulin could be safely used by him. The most important point was to go slowly. But every care must be taken in the matter of diagnosis. Insulin given in too large doses produced certain symptoms, such as flushing of the face, followed by pallor; and there might be local or general sweating, and a sense of constriction about the chest, or a feeling of impending disaster. Even unconsciousness, or motor or sensory aphasia might result. Professor Maclean pointed out that insulin, in nearly every case, gave the patient a sense of comparative well being and he was more energetic. In an unsuitable case the danger of giving insulin was very great. He did not think one could forecast, in a given case, what would happen in four or five years; but when eye changes occurred, there could be little hope of doing the patient good, though an effort could be made to eliminate the blood sugar by giving insulin. He had not yet seen a bad case of diabetes cured by insulin. In cases in which sugar appeared in the urine because of a leak in the kidney the giving of insulin might bring about disaster. If one went slow with the remedy, and the patient was meanwhile carefully watched, it was impossible for the general practitioner to go far wrong. A definite diet should be decided upon, and that should be adhered to practically throughout the treatment.

The insulin should be commenced with a small dose, and the quantity very gradually increased. He did not think it was necessary that those using insulin in general practice should be able to test the blood sugar. In every case the aim should be to render the urine sugar free. Even in cases where this was not achieved, the patients said they felt much better, and seemed to have more energy than normally. Another speaker, Dr. George Graham, said that while he had no doubt that insulin was of very great value in the treatment of diabetes, it could not be considered a substitute for the diabetic treatment. The more knowledge a doctor had about the disease, the better were his results likely to be. The ideal to be aimed at in the treatment was to render the blood sugar normal. In a case of coma, one got the answer as to the value of insulin treatment in four or five hours, but in mild cases one might have to wait years. Professor J. J. R. Macleod, of Toronto, stated that in Ontario, classes of instruction, two or three days each, had been largely attended by practitioners to learn about insulin, the various tests, and the behavior of the patients, and the Ontario Government, through the Provincial Board, were supplying to the profession insulin free of charge for use for poor patients. Dr. Poulton considered the use of insulin by the general practitioner was safe provided he proceeded slowly.

It appears, then, that the use of insulin by the general practitioner is safe, provided he exercises great discretion. But he must become scientifically versed in its employment and above all must be able to diagnose with accuracy. As a matter of fact, in the existing circumstances it seems that the general practitioner as a rule, and the country practitioner in particular, is not competent to administer insulin with confidence and perhaps his diagnosis is not always to be relied on. The general practitioner, in many instances, requires to be instructed in diagnosis and more especially as to the scientific employment of the remedy. The example of Ontario in establishing classes of instruction for practitioners to learn about insulin, the tests and the behavior of the patients, is one which might be followed in this country with benefit to all concerned, as well as the example of the Ontario Government in supplying to the profession insulin free of charge for the use of poor patients.

In many other respects the Ontario Government is setting a good example to the civilized world by the manner in which it is fighting against disease and caring for the health of its people. Recently it gave an object lesson in this direction, by voting to Dr. Banting an income of seven thousand five hundred dollars a year in order that he might continue to pursue medical research. Moreover, that he might be able to do this with a mind free from financial worry. Up to the present time research has been hindered and hampered by pecuniary considerations and in consequence progress has been comparatively slow. It is to be hoped that a new era is opening. As said before the discovery of insulin marks a new departure and holds out high hopes for the future. So far as the general practitioner and insulin are concerned, it may be said that generally speaking he requires more scientific instruction in its use from several aspects, but that with time and experience insulin will be in common employment among general practitioners. In the meantime the product itself will be improved and more learned of the matter in every way. The beginning of this form for treating diabetes is most promising.

WHOOPING COUGH

Each season brings its new contribution to the cure or alleviation of whooping cough. Of late, also, the discovery of the cause of the disease is a perennial announcement. The past year has given us two new methods of treatment. The intramuscular injection of ether is or was said to be effective. Surely this ought to have some effect, for a child that received such treatment would try mightily to suppress a cough that would bring on another injection. If this is a helpful remedy it certainly works along psychological lines.

The latest successful treatment of the disease to be announced is exposure to x rays. It was logical that the rays should be turned upon this disease sooner or later—logical, because it is being tried upon everything. It is said to produce wonderful results, again, probably, through mental processes. The machinery of the x ray production is impressive. We hope that both of these means of cure are as effective as they have been advertised, but in saying as much we are reminded of the colored preacher who expressed the hope that a deceased brother had gone "where we think he hasn't."

An outstanding feature of cures for whooping-cough is that they are effective with lapse of time, and the more time the more effective they are. Possibly, also, not a few of them, as we have dared to hint, have had some mental effect. Attempts have been made at quarantining the pertussis patient and with good reason, but the slow onset and difficulty in early diagnosis of the disease, together with its prolonged course, make isolation particularly difficult and unsatisfactory. The disease is usually in a communicable stage before it is recognized, the period of confinement of the child is a long one, and, besides, a great many cases are never reported. In some communities the tagging of the child has been tried instead of placarding the home. Certainly, in schools, the child with the cough should be excluded until the nature of the disease is determined. Even where reporting of cases and quarantine is incomplete it is well worth while, inasmuch as one group of the population, that which employs a family physician, is afforded some protection.

Besides entailing more prolonged suffering than any other disease of childhood, it is a most serious one from the high mortality in infants and its serious sequelæ which are probably more frequent than we know. It is to be hoped that the field of laboratory study in the prevention of this dread disease will not be neglected for the more spectacular affections of adult life.

WOMEN IN MEDICINE

Women have invaded the provinces of men in many directions and to some extent, it is difficult to indicate to how great an extent, have competed with them successfully on more or less equal terms. In this country and in Great Britain women have entered the medical profession in perhaps larger numbers than other professions, and on the whole appear to have justified their selection of a career. Opportunities in the medical profession are more frequent possibly in Great Britain for women in medicine than in America because preventive medicine seems to be making more progress in the former land and offers better facilities for women than ordinary practice. As a matter of fact, there are few women in general practice. Reviewing the matter from all angles, it may be said that although it is many years now since women were admitted to medicine their progress has lagged somewhat. They appear to be only adapted for certain forms of medical practice, evidence of this lack of adaptability was shown during the war more with women than men. Perhaps, physically and physiologically, they are not fitted for the rough and tumble of war or even of general practice and yet it is not wise to be dogmatic on this point as their powers of endurance are frequently greatly underestimated. In the factors which make for success in any sphere of life, it may be that women are not so well equipped by heredity as men.

Speaking a short time ago at the opening of the winter session of the Royal Free Hospital School of Medicine for Women in London, Sir Humphrey Rollesten, president of the Royal College of Physicians, pointed out that it had been recognized since Darwin's day that variability of body and mind was more frequent in men than in women, and this led to a greater proportion of genius, and its opposite, in the male sex. Men had a greater aptitude for the abstract, and women for the concrete. Taking as instances Lister, Osler and Horsley, he suggested that so far there had been no women's names of equal weight. The number who before or after qualifying gave up medicine was greater among women than men. Marriage depleted the ranks of medical women; the ablest fell by the way. Statistics showed that about thirty per cent. of women married before or after qualification. Genius was an extreme variation of Nature, and as there was greater uniformity among women, the number of geniuses was reduced. Women as a class, however, inherently were more lawabiding and conservative, through the long continuance of man's supremacy. Women were naturally intuitive, and in some cases it almost amounted to clairvoyance. This quality was of great importance in diagnosis and prognosis to the woman doctor when reinforced by training.

The speaker rightly insisted that much depended on mental and physical makeup, and women students should remember that as a class they were more likely to mental breakdown. It would appear that there is a definite place for women in medicine but that, at any rate, in existing circumstances they are not nearly so well fitted as men to practice medicine. In the course of time a type of woman may be evolved who will equal man as a practitioner of medicine, but that time has not come yet. Moreover, if it does come, she will lose some of her traditional womanly qualities, and will probably be of less service to the race than in former days.

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Obituary.

E. F. BASHFORD, M. D., O. B. E.,

London, England.

Major Ernest Francis Bashford, M. D., O. B. E., late director of the British Imperial Research Fund and adviser in pathology to the British Army on the Rhine, passed away at Manderscheid, Germany, on August 23, 1923.

Dr. Bashford was known all over the world for his researches into the causation of cancer and was especially well known to the medical profession of America which he visited more than once. He was born in Cheshire, England, in 1873, and studied at the University of Edinburgh, Berlin and Frankfort. He took the degree of M. D. with gold medal in 1902 and in addition was Van Dunlop scholar in anatomy, chemistry, zoology and botany; Mackenzie Bursar in practical anatomy; Whitman prizeman in clinical medicine; Holdsworth Research Scholar in experimental pharmacology; Stark Scholar in clinical medicine and pathology; and Pattison Prizeman in clinical surgery. When he graduated he was awarded the McCosh graduate's scholarship for study and research in the medical schools of Europe, and went to Germany where he studied bacteriology and pharmacology at Berlin University and worked with Ehrlich at the Royal Prussian Institute for Experimental Therapeutics at Frankfurt. He also studied at Frankfurt as Weigert-Grocers Research Scholar from 1900 to 1902 and was awarded the Milner Fothergill Gold Medal in therapeutics at Edinburgh University in 1901. He became assistant to the director of the Pharmacological Institute, Berlin, in 1901, and assistant to the professor of materia medica, pharmacology and clinical medicine in Edinburgh in 1902.

As said before, Dr. Bashford made a great reputation in Great Britain and in Europe, as well as in this country, by his investigations into cancer and also in toxicological research. He founded the modern experimental investigation of cancer in Great Britain and placed the statistical and biological investigation of that disease upon a comparative basis. He was honorary president of the First International Cancer Congress at Heidelberg in 1906. In 1911 he was awarded the Walker Prize for the quinquennial period 1905-10, and during 1911 and 1912 he was Ingleby Lecturer at the University of Birmingham, Middleton Goldschmidt at New York, and Leyden Memorial Lecturer at Berlin.

PAUL WATERMAN, M. D.,

Hartford, Conn.

The New York Neurological Society, at its 406th regular meeting, held on October 2, 1923, adopted the following resolutions on the death of Dr. Paul Waterman, which occurred recently at his home in Hartford, Conn.:

Whereas, It has pleased God in His infinite wisdom to remove from us our fellow member, Paul Waterman, of Hartford, Connecticut; and

Whereas, The Society feels that in his death it has lost a friend distinguished alike in his chosen field of medicine, in the civic life of his city and State, and in the service of his country in the World War; be it

Resolved, That the members of the New York Neurological Society extend their most sincere sympathy to the family and friends of Colonel Waterman; and be it further

Resolved, That copies of these resolutions be sent to the family, to the *Journal of Nervous and Mental Disease*, the *Archives of Neurology and Psychiatry*, the New York Medical Journal and Medical Record, and a copy preserved in the archives of the Society.

Edwin G. Zabriskie, *President*
L. Pierce Clark,
Chas. E. Atwood, *Secretary*,
Committee from the Council.

News Items.

Dr. Gehrung Honored by French Government.—Dr. Julien A. Gehrung, of New York City, has been made a Chevalier of the Legion of Honor by the French Government. He served in the medical corps of the French army before the United States entered the war.

New Officers of Mental Hygiene Committee—Dr. William H. Welch, dean of the School of Hygiene and Public Health at Johns Hopkins University, Baltimore, was elected president of the National Committee for Mental Hygiene at its annual meeting at the Hotel Pennsylvania recently to succeed Dr. Walter B. James, of New York. Clifford W. Beers was reelected secretary and Otto T. Bannard, treasurer. Dr. Charles W. Eliot, president emeritus of Harvard University, and Dr. Bernard Sachs, of New York, were reelected vice-presidents.

New Dean of Johns Hopkins Medical School.—Dr. Lewis Hill Weed has been named by the trustees of Johns Hopkins University as dean of the Medical School. Dr. Weed, who is professor of anatomy at the institution, succeeds Dr. J. Whitridge Williams, who recently resigned to devote his time to the women's clinic of Johns Hopkins Hospital. He joined the Johns Hopkins faculty in the fall of 1914 as instructor of anatomy. Since 1919 he has been a full professor in anatomy. During the nine years he has spent at Hopkins Dr. Weed has been associated closely with Dr. J. Whitridge Williams.

Tuberculosis Campaign for Lower Manhattan.—More tuberculosis is prevalent south of Fulton Street, lower Manhattan, than in any other section of equal area in the entire city and the death rate is three and a half times the average for this disease. In the hope of effecting an improvement in this condition the Bowling Green Neighborhood Association has started a campaign for cooperative effort in fighting the disease in this locality. This district is exactly twenty-five years behind the times in tuberculosis death rate, its rate for the disease today corresponding with the average for the entire city a quarter of a century ago. For every tuberculosis death in the district there are six living cases. Medical experts estimate that one out of every sixty persons in the downtown area is afflicted with the malady.

Jersey Vital Statistics.—There were 2,793 deaths in New Jersey during the month ended September 30th, according to vital statistics of the State Department of Health. There were 426 deaths among children under one year of age; 142 deaths of children over one year and under five years of age, and 955 deaths of persons sixty years of age and more. There were 27 deaths from suicide, as compared with 35 during the previous month. Diseases of the circulatory system caused 460 deaths in September; nervous diseases took 307 lives. Cancer and other diseases considered incurable claimed 268 victims during the month. There were 222 deaths from Bright's disease, 164 from tuberculosis, 175 from diseases of the digestive system, and 163 deaths from infantile diarrhea.

Foreign Correspondence.

LONDON LETTER

(*From our own correspondent.*)

London, *October 26, 1923.*

PERIODICAL MEDICAL EXAMINATION.

It has been suggested that policy holders in insurance companies should be examined periodically, and this subject was discussed recently at a conference convened by the Federation of Medical and Allied Services presided over by Sir Malcolm Morris. Among those present were Sir Thomas Horder, chairman; Sir Squire Sprigge, editor of the *Lancet;* Dr. N. Howard Mummery, medical director of the Federation, and representatives of a large number of insurance companies. Sir Thomas Horder said that they wanted to extend the wise practice of seeking a periodical overhauling of the body, in order that signs of departure from normal health might be detected before disease manifested itself. The first step seemed to lie with the life insurance offices, which could encourage the practice by offering inducements to their policyholders to benefit themselves, decrease mortality, and improve the general health. He recommended, however, that the adoption of the proposal should be gradual, or they might alienate a large section of the community. Major L. G. S. Molloy, M. P., moved a resolution approving the principle. It would, no doubt, he said, tend to prevent disease. It would be a great advantage to the policyholders, provided it were gratuitous, and to the medical profession, who would conduct the examination, although it would involve a great deal of expense to the insurance companies. The discussion which followed the speeches disclosed the fact that the insurance companies were by no means convinced that the adoption of the principle would be to their advantage. Dr. Otto May moved an amendment expressing approval of the periodical medical examination "of all citizens" as being more noncommittal and this was substituted for the original resolution which restricted examination to policyholders.

MEDICAL MEN AND PROHIBITION.

At the present time a conference of the *Ligue Internationale des Adversairies des Prohibitions* is being held in London. At the opening session Sir Archdall Reid, who has written one of the most scientifically emphatic books on the subject of alcohol, and on alcoholism and heredity, was the principal speaker. The title of his paper was the fallacy of prohibition. He declared that he was strongly in favor of keeping the habitual drunkard sober by force if necessary and of forbidding him to perpetuate his kind. A law forbidding offspring to inebriates, said the speaker, would, like other laws, have its successes and failures. At any rate, prevention of offspring to them was the sole possible road to racial temperance. He pointed out that many races of men were exceedingly susceptible to the lure of alcohol. The North American Indians when afforded opportunity, not only drank furiously, but were furious when drunk. As a rule men were moderate or immoderate in proportion to their susceptibility to the charm of alcohol. The point, however, that Reid insists on is that every race is resistant to the effects of alcohol in proportion to the length and severity of its past experience of alcohol. When governments tried to enforce prohibition they entered into a fight against Nature in which they were always beaten in the long run. Professor Starling, the great British physiologist, has brought out a book recently to which many well known medical scientific men have contributed, in which moderate drinking is upheld. Excess is reprobated and admitted to be most harmful by all but the consumption of alcoholic beverages in strict moderation appears to be believed by many authorities to do more good than harm.

THE EVOLUTION OF DIET.

Dr. Harry Campbell is the first authority in this country on the evolution of diet or evolution and diet. On October 23d he gave a lecture on the subject at the Institute of Hygiene in London in which he denied some popular beliefs as to the diet of early man. Early man is generally pictured as surrounded by a profusion of sweet tasting seeds and luscious fruits in an Eden of plenty, with merely the trouble of plucking them. According to Dr. Campbell the fact was that during the earliest period man's diet included all sorts of animal food from fish, birds, birds' eggs and every species of mammal down to frogs, lizards, snakes, shellfish, worms, snails, insects, caterpillars and grubs. Honey was available, while seeds and nuts provided protein food, fruits gave carbohydrates and salts, and fleshy vegetables gave starch. There were also berries, leaves and shoots. After the anthropoid period man became more intelligent and nomadic. He could trap small animals, and was able to reject, to some extent, the less palatable and indigestible vegetables. Then came the period when man learned to hunt and fish. Better supplies of animal food led to its greater use, with a subsequent lessening of the ability to digest raw vegetables. Cookery, which came next, was probably the most epoch making of all discoveries, for with it man secured the master key to limitless supplies of food, especially starchy forms. Starch foods were now consumed to an enormous extent and in a pappy form which could be swallowed without mastication. The modern diet was literally deluged with starchy foods which slipped down the gastrointestinal tract with a facility which could only be characterized as disastrous. Man had accordingly passed from vegetarianism to a mixed diet which tended to revert to vegetarianism. Man was less able to digest raw vegetables, but a race was being evolved capable of being reared on cow's milk and of digesting enormous quantities of starch and sugar. Dr. Campbell concluded by saying that it was incorrect to assume that disease and premature death resulted from animal food as man was for a long time more carnivorous than vegetarian.

ADDRESS BY DR. J. A. FORDYCE OF NEW YORK.

A special meeting of the Section of Dermatology of the Royal Society of Medicine was held in the house of the society on October 18th; Dr. E. Graham Little, the president of the section, was in the chair, to hear an address by Dr. J. A. Fordyce, of Columbia University, New York. The subject of the address was the results of treatment of syphilis of the nervous system. For the purpose of comparative study Dr. Fordyce and his colleagues had grouped their 442 cases under the following tentative diagnoses, based on the clinical and laboratory findings: 1. Secondary neurosyphilis; 2, vascular and moningovascular; 3, pretabes or tabes imperfecta; 4, tabes well developed; 5, optic atrophy and general paralysis. Three hundred and sixty-five of the 442 cases had been examined from one to ten years after treatment had been discontinued. Ninteen cases of secondary neurosyphilis were treated intraspinally because of the persistence of their symptoms and the fact that there were fluid findings after from one to three doses of salvarsan given intravenously and mercury intramuscularly. Wassermann was positive in all cases either in the blood or in the fluid; in a large majority in both. The cell count ranged from normal to 940. Five of the nineteen cases received more than one dose of combined intravenous and intraspinal treatment; eight had more than two doses; five had more than three doses. In all the nineteen, the headache, insomnia, vertigo, aphasia, and facial palsy disappeared. Those which had marked tendon and papillary changes had them still. In every case the reaction became negative in the blood, and in only two cases remained weakly positive in the fluid. Of 116 cases of paresis treated intensively 39 died, 30 had passed from observation, and 47 were known to be still living. He could not report any cures, though remissions were induced in 46 patients, the intervals lasting from a few months to several years. Before he left New York treatment had been begun with the new arsenical preparation tryparsamid in a number of paretics; he could not yet pronounce as to its value.

Dr. Fordyce summarized his conclusions as follows: The central nervous system is mostly invaded during the general dissemination of the virus. Often it was checked, seldom cured, by the usual therapeutic methods. Late neurosyphilis is not due to reinfection from foci, outside the nervous system, but to long persistence in loco of the infecting organism. If the nervous system was not involved early in the infection, probably it would not be involved later; this with the exception of vascular lesions and gummata. In the presence of a persistent Wassermann, the possibility of a nervous system lesion, should be borne in mind. Treatment should not be stopped without the information that could be gained from lumbar puncture. Certain types of nerve syphilis were more rapidly controlled by combined intravenous and intraspinal treatment, and sometimes only by this method. In general paralysis remissions of long duration were achieved which were more striking in patients with a pronounced meningeal reaction.

In the general discussion which followed, Dr. J. H. Sequeira pointed out that the work done long ago by Head, Fearnsides and others showed that the spinal cord and brain were affected in very early stages of syphilis. All the available knowledge showed how important it was to commence treatment for syphilis at the earliest possible moment. Dr. H. MacCormac remarked that it might be said the neurologist saw the failures of the dermatologist in this disease.

BOOK ON GIRTH CONTROL TO BE PUBLISHED.

A book on *Girth Control, the Cure of Obesity and Constipation*, by F. A. Hornibrook, with a preface by Sir William Arbuthnot Lane, will be published soon by William Heinemann, Ltd., London.

LATIN AMERICAN LETTER

(*From our own correspondent.*)

BALBOA HEIGHTS, *November 2, 1923.*

MARITIME QUARANTINE CONFERENCE.

The chief quarantine officer of the Panama Canal, Surgeon W. C. Rucker, U. S. P. H. S., returned from the United States on October 20th and immediately took up the completion of the plans for the conference of the Maritime Quarantine Authorities of the West Coast of South America. This conference, which has for its object the standardization of maritime quarantine on the western coast of South America, has been called by President Belisario Porras to meet in Panama City, R. P., on January 8, 1924. Representatives from Panama, Colombia, Ecuador, Peru and Chile will attend. Surgeon General H. S. Cumming and assistant Surgeon General John D. Long will attend the meeting on behalf of the United States Public Health Service, and Colonel H. C. Fisher, M. C., U. S. A., chief health officer of the Panama Canal, will represent his department. While a large attendance at this meeting is not expected or aimed at, its results will be farreaching in the rationalization of quarantine and in expediting the movements of ships, cargoes and passengers.

There is little doubt that many of the practices of quarantine are archaic in view of our modern knowledge of the means of transmission of disease and the rapid means of travel and communication which the world now has. Diseases which were once a very genuine menace to the welfare of the United States have been freed of their terrors by scientific research. Yellow fever now exists in only two localities in the western hemisphere; typhus (to continue the enumeration of the quarantinable diseases) is almost always present in New York City yet does not spread because of the bathtub; smallpox is easily prevented; for the most part, human beings play a relatively small rôle in the spread of bubonic plague; cholera would have small chance of spreading in a country in which typhoid fever is of relatively rare occurrence; and leprosy, the last of the diseases mentioned in the quarantine disease act, is known to be conveyed only by prolonged, intimate contact. Thus, so far as the United States and the Panama Canal are concerned, a considerable amelioration of quarantine might take place without harm to public health. However, there are many countries in a less fortunate sanitary condition and any abatement of the barriers against disease incursion might result in disaster. Therefore, any changes in the international quarantine regulations require farreaching thought and that enlightenment which comes from face to face discussion. The quarantine regulations of most countries contain much dead wood and senseless verbiage designed to "shoot if it's a deer and miss if it's a calf." Many things are being done under the guise of quarantine "because they always have been done," others because quarantine regulations do not always authorize quarantine officers to exercise that judgment which scientific men now have with regard to disease and still others because of that dread of change which is the heritage of all mankind. Conferences like that to be held at Panama are therefore of the greatest value in modernizing and rationalizing maritime quarantine.

COMBATTING YELLOW FEVER.

Dr. Henry Hanson, of the International Health Board, is in Panama purchasing office equipment for the central offices which he is establishing at Barranquilla, Colombia. Dr. Hanson is the director of the campaign against yellow fever in the Republic of Colombia and is assisted in this work by Dr. Frederick A. Miller and by L. H. Dunn, entomologist, and G. W. Stuart, sanitary engineer. Eradicative work has been begun at Bucaramanga and preventive campaigns have been launched at Cucutá, Girardot, Puerto Berrio, Barranca Bemeja and Puerto Wilches. These are all interior towns and are in the general littoral of Santander Province where the yellow fever epidemic early in 1923 occurred. Work will also be conducted at Cartagena and Santa Marta on the seacoast and at all ports on the Magdalena River, the main travel route of the republic. Illustrative of the degree of mosquito infestation which is being met, Dr. Sainz, one of Dr. Hanson's medical inspectors, visited 959 houses in Barranquilla and discovered mosquito breeding in 949. He was not able to determine accurately the presence or absence of larvæ in the other ten on account of the turbidity of the water! He obtained practically the same results in Puerto Columbia. This campaign represents practically the last stand of yellow fever in northern South America. The last case of the disease in Panama was in 1905, in Ecuador in 1919, in Peru in 1921 and in Mexico on January 15, 1923. With the giantic eradicative campaign which is being launched at Bahia, Brazil, under the direction of that veteran warrior against pestilence, Dr. J. H. White, yellow fever will soon be an extinct disease in the western hemisphere.

ISTHMIAN CANAL ZONE MEDICAL MEETING.

The 202nd meeting of the Medical Association of the Isthmian Canal Zone was held at Colon Hospital on October 19, 1923. The members from the Panama (Pacific) side of the Isthmus made the journey to and from Colon by track motor. The following program was presented: Presentation of case of perforated peptic ulcer, with recovery, by Dr. Tom S. Mebane; remarks on cases of clinical interest treated at Colon Hospital: Acute rheumatic fever in the negro, myocarditis with advanced cardiac decompensation with complete and permanent restoration of function, angina pectoris and auricular fibrillation with restoration of normal rhythm by quinidine, and a case of ruptured uterus during labor, by Dr. W. V. Levy; lengthening of the quadriceps in extraarticular ankylosis of the knee joint, treatment of head injuries and an analysis of eighty cases of appendicitis treated at Colon Hospital during the past year, by Dr. T. S. Mebane.

It is believed that the cures which are being made at the Palo Seco Leper Colony are the cause of the increased admissions from the interior of the Republic of Panama to that institution. On July 23rd there were fifty-eight males and twenty-seven females in the institution. Treatment with the ethyl esters of chaulmoogra oil is being administered by Dr. Philip Horwitz. With the exception of those patients who have died or who have been returned to the Colony for treatment, there have been eighteen paroles since September 3, 1914. Five of these were granted during 1923.

NEW HOSPITALS FOR PANAMA.

The Republic of Panama has inaugurated five thirty bed hospitals in various parts of the interior. These are under the direction of Santo Tomas Hospital of Panama City, of which Major E. A. Bocock, M. C., U. S. A., is superintendent. These hospitals are located at Colon, Bocas del Toro, David, Santiago and Chitré, each being in the principal town of its Province. These are really the outgrowth of old hospitals located at the same places and will be remodeled and modernized both as to buildings and equipment. They are designed to care for cases requiring short treatment, minor injuries and minor surgical operations. All complicated cases and those which will require treatment over a considerable stretch of time will be sent to the main hospital, i. e., Santo Tomas. It is hoped that each of these branch hospitals will in time become health centres for their respective provinces. All charges for maintenance will be paid by Santo Tomas out of funds set aside for the purpose by the central government.

OCCUPATIONAL AIDE FOR INSANE HOSPITAL.

As an extension of the work of occupational therapy introduced by Dr. Louis Wender, former superintendent of Corozal (Insane) Hospital, the present superintendent, Captain G. E. Hesner, M. C., U. S. A., recommended to the chief health officer the employment of an occupational aide. This recommendation was approved and through the assistance of the National Committee for Mental Hygiene, a suitable appointee has been secured and will sail shortly from the United States.

RAT POISONS PROHIBITED.

The discovery of organisms of the paratyphoid group in samples of rat poison submitted to the laboratory of the health department for examination has resulted in the prohibition of the sale of such products in the cities of Colon and Panama.

BOTTLED MILK ONLY FOR ZONE.

The Health Depatrment of the Panama Canal has received a shipment of 20,000 milk bottles which will be sold at cost to the milk dealers of Colon and Panama in order to insure that only bottled milk will be sold in the terminal cities and in the Canal Zone.

MEDICAL STAFF ADDITIONS.

Recent additions to the medical staff of the Panama Canal are Captain Henry J. Hayes, M. C., U. S. A., who as been assigned to duty at Corozal Hospital, and Major J. M. White, M. C., U. S. A., who has taken up his work at Ancon Hospital. Lt. Col. S. J. Morris, M. C., U. S. A., has reported for duty as department medical inspector and assistant to the department surgeon, Colonel Henry Webber, M. C., U. S. A.

WEEKLY CLINICAL MEETINGS AT ANCON HOSPITAL.

Physicians and surgeons visiting the Isthmus should bear in mind the weekly clinical meetings which are held at Ancon Hospital Thursdays from 11 to 12 a. m. Many interesting cases are shown and demonstrations of the newer clinical laboratory tests given. Once a month there is a journal review at which resumés of recent medical literature are presented. Medical visitors are always welcome and they will find much to interest them there. The attendance at the clinical meetings is representative of the medical corps of the army, navy and public health service as well as of the health department of the Panama Canal and the local medical profession, and visitors at the clinical conferences will thus have an opportunity to meet a number of those who are doing medical work in Panama.

GENEVA LETTER

(*From our own correspondent*).

GENEVA, *September 15, 1923.*

ENTAMEBA AND SPIROCHETA IN PYORRHEA.

The entameba gingivalis has been regarded as the cause, or one of the causes, of alveolar pyorrhea by many observers in Russia, the United States, Italy, France, Switzerland and Germany. Alveolar pyorrhea is such an important morbid process from both the medical and surgical viewpoints, that all new data on the subject can never be devoid of interest. Therefore a short account of some research work, undertaken recently at Lausanne by D. Zouraboff, should be enlightening.

Bass and Barrett conclude that the entameba gingivalis is found in every mouth but not constantly and they are more numerous in cases of gingivitis. They are, however, of the opinion that this organism is not the cause of alveolar pyorrhea.

Upon what do the partisans of the specific pathogenic part played by this ameba base their assertions? First, its presence in alveolar pyorrhea; in point of fact, it is not always found. Secondly, on its absense in healthy mouths. There are cases, twenty-nine per cent. in the researches of Wessels, Williams, von Scholly, Rosenberg and Mann, and forty-one per cent. in Mendel's, where the organism was found in perfectly healthy mouths with normal gums. Thirdly, the results of treatment with emetine hydrochloride, although, besides the good results, completely negative results have been obtained from its use. For example, Mendel having made instillations in the purulent pockets and intragingival injections with this drug found that in eight cases of pyorrhea it was a complete failure. Ruoff treated 187 cases of pyorrhea with extract of ipecac fluid and emetine hydrochloride and noted a temporary disappearance of the amebæ and their reappearance within two to three weeks. This observer concludes that emetine is an amebicide but it is incapable in itself of curing alveolar pyorrhea.

TREATMENT OF PYORRHEA.

In the majority of cases of this disease, besides the ameba when it is present, there are numerous spirocheta and it is to be noted that in these circumstances many cases of pyorrhea are cured after a time by the various arsenical compounds now so generally used in syphilis. They appear to have a specific action on these buccal spirochetes. This has been confirmed recently by Kolle who treated an enormous number of cases in the German army in 1918, and observed that the pyorrhea was in all probability produced by the spirocheta dentium which he found in almost pure cultures.

Given the fact that the entameba gingivalis had only been found once in 1916, at Lausanne, by Prof. Galli-Valerio and as both American and French observers have lately given considerable attention to this buccal parasite and the part played by it in alveolar pyorrhea, Zouraboff at Lausanne took up the subject with the view of discovering the frequency of the entameba gingivalis as well as its probable etiological part in the production of pyorrhea. The white substance covering the neck of the tooth was removed on a wooden toothpick and spread on a cover glass. When dried in the air it was treated with methyl alcohol. For each case four slides were prepared. Upon several occasions Zouraboff essayed staining the preparations with Giemsa, diluted 1 in 20, and although they were allowed to remain for fifteen or twenty minutes, even six hours, a bad result was invariably obtained; the bacteria, epithelial cells and leucocytes were all stained pale and the stain was diffuse. This observer has never been able to discover ameba or spirocheta dentium by means of this rapid staining process.

COMPARATIVE STATISTICS.

In Mendel's statistics gathered at Paris, the ameba was found in 95 per cent. of the cases, while those of Wessels, Williams, von Scholly, Rosenberg and Mann give 60 per cent. Therefore at Lausanne the entameba gingivalis is relatively less frequent in pyorrhea than in Paris and the United States, the only countries offering statistics. In Germany, according to Hartmann and Schilling, the organism exists in the majority of the people.

A much greater difference is shown if the frequency of ameba in subjects without pyorrhea or gingivitis is compared. Of forty-two subjects with healthy gums in only one did Zouraboff discover it—2.4 per cent., while Mendel found it in forty-one per cent. and Wessels, Williams, von Scholly, Rosenberg and Mann in twenty-nine per cent. Starting from the fact that amebæ were absent in fifty-one per cent. of the pyorrhea cases he examined, that in one patient treated with emetine the gingivitis remained although the ameba disappeared, and that in the majority of cases of pyorrhea the organism was associated with the spirocheta dentium, Zouraboff concludes that the entameba gingivalis is merely an accidental parasite of pyorrhea and gingivitis, developing on a favorable soil. He also points out that this is also confirmed by the results obtained with 606 and the almost constant presence of the spirocheta dentium. This speaks in favor of the pathogenic part played by this parasite in this morbid process..

ENTAMEBA IN GOITRE.

Evans recently searched for the entameba gingivalis in the tonsils of goitrous subjects and found it in ninety seven per cent. of the cases. In eighty-one per cent., the patients treated with emetine hydrochlorate and afterwards examined showed that the organism had disappeared. He then exhibited emetine to twenty-three subjects with goitre, with the result that the tumor was reduced in size in eighteen.

Zouraboff examined ten cases of goitre but was unable to observe any ameba or spirocheta in the smears taken from the substance coating the tonsils. Although the cases were few as compared with Evans, the Lausanne observer, thinks that his results speak against any pathogenic part played by entameba gingivalis in the production of goitre.

Book Reviews

DIET

Anleitung für die Ernährung von Zuckerkranken mit praktischen Anweisungen für die Diabetesküche (nach weiland Dr. Gilbert's *Diabetesküche* und weiland Prof. Dr. *Albert Albu's Grundzüge für die Ernährung von Zuckerkranken*), bearbeitet von Dr. med. Edwin Silbermann. Mit einem Vorwort von Geh. Rat Prof. Dr. H. Strauss, Berlin, Halle a. S.: Carl Marhold Verlagsbuchhandlung, 1923.

This little handbook is a successor of similar books by Gilbert and Albu. It is intended to give the diabetic laymen instruction in the preparation and selection of his food. It teaches him that carbohydrates must be more or less eliminated from the diet according to his needs. In some cases the proteins are also restricted. Fats and vegetables poor in carbohydrates, especially the green vegetables and salads, should constitute the mainstay of the diabetic diet. Careful medical observation and the strictest carrying out of the physician's orders are absolutely necessary. The ingredients and the manner of preparation of all the dishes are described minutely. With this booklet in his hands the diabetic patient need never become tired of his diet as there is an abundant choice from which to choose.

DIET

What to Eat and How to Prepare It. By Elizabeth A. Monaghan. New York: George H. Doran Co., 1922.

A very simple little volume on the relation of food to health. The author states that her work is the outgrowth of Alfred W. McCann's *The Science of Eating,* and the book takes its place as a member of the younger set of books on the subject of food in health. Miss Monaghan writes in an easy jocular vein, the effect of which is heightened by large type and generous paragraphing. Part II on Preparing the Food is valuable. The recipes are clear and comprehensive. There is another valuable chapter containing menus for anemic, undernourished or convalescent people that ought to be a boon for nurses and those having sick ones in the home. Children's diet is given some attention and a chapter for the girl who works contains a lot of good information and practical hints.

THE EYES

Ophthalmic Surgery. A Handbook of the Surgical Operations on the Eyeball and Its Appendages as Practised at the Eye Clinic, University of Vienna, by Dr. Josef Meller. Edited by Dr. William M. Sweet. Third Edition Translated from the Second Edition, *Augenaerztliche Eingriffe* (Josef Safar, Vienna). With 219 Original Illustrations. Philadelphia: P. Blakiston's Son and Company. 1923.

The third edition of this deservedly popular work has been enlarged by over seventy pages of reading matter, and by forty-six very interesting illustrations. The period of ten years intervening between this and the preceding edition has not been particularly productive of great changes or any marked discoveries in the operative domain of the eye, barring, of course, the plastic work resulting from the experiences of the Great War; though even for this the time is not yet ripe to formulate a definite opinion. Whatever of interest and permanent value did find its way into practice during this period has been incorporated in this work which has been thoroughly rearranged, rewritten and considerably enlarged, as, for instance, the entire chapter on cicatricial entropion; additional paragraphs on spastic entropion; a great deal of additional matter on operations on the orbit; extraction of foreign bodies from the eye; certain notes on local anesthesia for enucleation, etc. Of especial interest are the additional subjects on Elliott's sclerocorneal trephining that is dealt with at considerable length, and treatment of detachment of the retina to which almost six pages are devoted as contrasted with the few lines in the preceding edition.

The possessors of the former edition will find this one interesting for its additional contents. In the hands of its first readers it is sure to become a valuable guide in all their operative work on the eye. A certain tragic touch, of undoubted human interest to the American reader, is imparted to the book by its author's dedication to the "Rockefeller Foundation With Feelings of the Deepest Gratitude for the Magnificent and Noble Support, in the Years of Distress, it Granted the Medical Faculties of the Austrian Universities."

CONFESSIONS OF A PSYCHOLOGIST

Life and Confessions of a Psychologist. The Autobiography of G. Stanley Hall, Ph.D., LL.D. New York: Appleton & Company, 1923.

It was that he might truly know himself that Dr. Hall set down this fascinating record of a life. The childhood background, the parents, their interests and conflicts, all the factors that were to mould the youth, are understood and objectified. There is none of the just personal pride in the achievements of his life time, save what any man might feel in looking at the solid bulk of work accomplished. The storehouse of a productive thinker's mind has been probed, emotions, opinions, experiences and beliefs turned over and looked at dispassionately, above all, honestly. The history of education in this country, spanned by the life of the greatest living American psychologist, is a history that is singularly one with the man. He is the history of education. Without him it might well have had no history—and no historian.

PHANTASY

Deirdre. By James Stephens. New York: The Macmillan Company, 1923.

Rarely does an age old song come down to us intact. Of course it is our fault. The songs are there, but only for the few whose pulses thrill to that type of literature. In general the denizens of *Main Street* respond to the urge of "Jazz her up," and "Make it snappy."

In *Deirdre,* Stephens has sung a harper's lay in his own mellow words, preserving that clear conciseness of thought and image, crisp and yet gladdening as a spring breeze. The old story of the beautiful ward of a king, who follows her heart's choice through countless perils and finally to death is as real to us, and as tragically beautiful, as when the legendary characters were first caught in the web of love and reality. A vague memory of Synge's poem, Deirdre of the Sorrows, serves to fix the tradition in our minds, studded as it was with gleaming pictures and the music of echoing words. Stephens's *Deirdre* steps on to the scene and *is* Beauty, Music, Life and Tragedy.

Medicoliterary Notes.

Since the incidence of diphtheria in the Borough of Richmond was relatively greater than that in any other borough, the New York City Department of Health made a survey of the records of all cases reported from January 1st to August 15th inclusive. The findings of this survey testified in a significant way to the value of the Schick test. The largest school district, with an estimated population of twenty thousand, had only sixteen cases, while the next to the largest, with a population of seventeen thousand, had sixty-nine cases. The larger district had had thorough Schick work done in its schools, while the other, in which the cases were most numerous, has only one public school of fair registration and a parochial school, in neither of which had any of this work been done.

* * *

The publication of a collection of studies, based upon personal investigation, by Frank Tannenbaum, of social conditions in the South, including the prison problem and the Ku Klux Klan, has been announced by Putnam for the early spring.

* * *

A recent volume from the Johns Hopkins Press is entitled *The Public Health Service: Its History, Activities and Organizations.* The author is Laurence E. Schmeckbier.

* * *

A Medical Dictionary for Nurses, compiled and edited by Amy E. Pope, has recently been put on the market by Putnam. It is a compact volume of less than three hundred pages, but is fairly comprehensive in scope. It gives definitions, derivation and pronunciation, and has supplementary tables of weights and measures, chemical symbols, and other material.

* * *

In the *Century* for November Glenn Frank has an entertaining article entitled Sackcloth and Cymbals. His belief is that "the whole world today is in a mood of transient hysteria. And this hysteria is only another way of saying that the world is wool gathering." The writer discusses also H. G. Wells's opinion that we are about to cast off our "sackcloth" and enter upon an era of humor; the new Dark Ages predicted by Dean Inge of London; and the possibilities of a coming renaissance prophesied by other writers of the day.

* * *

The University of the State of New York has prescribed for pupil nurses in the senior year of training schools a course of lectures on public sanitation. The purpose is "to give the nurse a general practical knowledge of the methods which are being used to protect the health of individuals and communities, so that she may cooperate practically with boards of health and other preventive agencies, and be able to take a definite share in educating the public in matters relating to public health." Some of the subjects to be covered are sources and modes of infection, sewage and garbage disposal, water and food supply and ice, ventilation and housing, industrial hygiene, hygiene of schools, public buildings, and conveyances, vital statistics, and health departments and legislation.

* * *

The October number of the *Medical Brief,* published in St. Louis, contains two articles of particular interest: a full story of insulin and its discovery, by J. J. R. McLeod, professor of physiology in the University of Toronto; and a reprint of the address on The Psychoses, given by Dr. Edwin Goodall, medical superintendent of Cardiff Mental Hospital, at the July meeting of the Medico-Psychological Association of Great Britain and Ireland.

* * *

The fourth series of Frank Harris's *Contemporary Portraits* is announced by Brentano's for publication in the near future. The volume is done in the author's characteristic style, and will include sketches of Matisse, Turgenief, Leonard Merrick, Senator La Follette, Charlie Chaplin, and Richard Wagner.

* * *

An interesting fact about the practice of medicine in China is to be found in a recent report of Prof. W. D. Matthew, curator of the Department of Vertebrate Paleontology at the American Museum of Natural History. The report states that in China fossil teeth and bones are used as medicine, and have been mined for centuries to supply Chinese drug stores with "dragon's bones" and "dragon's teeth." "There are four ways of administering them. They may be ground to powder in a mortar and eaten raw. Or they may be ground and fried with oil in a skillet. Or the powder may be stirred up with sour wine and either drunk off fresh or the mixture left to settle, decanted, and the clear liquid drunk. They are a specific for certain nervous diseases, heart troubles and disorders of the liver. Without recommending the remedy for adoption in this country, it is perhaps permissible to point out that mixing with sour wine would result in a combination of bicarbonate and acid phosphate of lime that might really have some medicinal value, just what may be left to physicians to decide."

* * *

An article on dust and its sources in a recent issue of the *Popular Science Monthly* states that the most spectacular source is the dust storm, in which the soil of dry areas is carried overland by high winds for many miles. The greatest dust fall ever recorded was in 1920, when, it was estimated, two million tons of the soil of Colorado, Wyoming, Kansas and Nebraska was lifted many thousand feet and carried by a fierce wind storm into the region of the Great Lakes and the St. Lawrence, where it was deposited in the form of dust particles during a snow storm lasting only two days.

* * *

A study recently made by the Rockefeller Foundation shows that the United States has the largest number of medical schools of any country in the world—eighty-two. Great Britain has forty-three, France thirty-two, and Russia twenty-eight.

Practical Therapeutics

ON THE VALUE OF THE RÖNTGEN RAY IN THE DIAGNOSIS OF CHRONIC APPENDICITIS*

By Maurice Feldman, M. D.,
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The difficulty in the diagnosis of chronic appendicitis at times is well recognized. This is not only due, often to the frequent occurrence of this affection without the usual clinical manifestations ordinarily observed in this disease, but also because of the occurrence of other lesions which may present themselves in the lower right quadrant. These difficulties may now often be overcome by means of the x ray, which affords us a means of more thoroughly clearing up the diagnosis in obscure cases.

In the röntgen ray diagnosis of chronic appendicitis the most valuable information upon which a correct diagnosis may be based, is found in the definite anatomical and pathological changes observed in the appendix itself. On the other hand, the indirect signs in the diagnosis of this disease are most helpful and are especially valuable when confirmed by clinical findings; while the diagnosis is often misleading when based upon insufficient röntgen signs or faulty interpretation.

A negative röntgen ray result may be helpful to the clinician in differentiating disease of the stomach and duodenum from right lower quadrant lesions. A differential diagnosis must be made from gastric and duodenal ulcer, gallbladder disease, right kidney, ureteral and pelvic affections. Again it may be important to distinguish chronic lesions of the appendix from other affections commonly occurring in the lower right quadrant, as dilatation of the cecum with retention, an incompetent iliocecal valve and ileal stasis, adhesions and angulations, as well as ulcerations due to carcinoma or tuberculosis.

In the diagnosis of chronic appendicitis, the following direct and indirect signs must be taken into consideration.

DIRECT SIGNS.

1. Visualization of the appendix. The percentage of visualized appendices varies with the technic according to the various observers. According to our method purgation is not permitted for at least twenty-four hours before the examination. Spriggs and Marxer state that the appendix is most frequently visualized when the bowels had been emptied by castor oil given thirty-six hours before the opaque meal of barium and buttermilk. Other observers prefer the patient in a constipated state.

2. The appendix is regarded as suspicious when found retrocecal or directed upward. It may be directed downward or to the left side.

3. The normal calibre of the appendix is one sixteenth to one quarter of an inch in diameter. In diseased conditions it may be found much dilated.

4. A tender area observed directly over the appendix and moving with it, is an important röntgen sign of disease of this organ. Of 273 cases reported by Case in which the appendix was filled with bismuth, there was a definite tenderness corresponding to the appendix shadow in 236 or eighty-five per cent.

5. The appendix should normally empty coincidently with the cecum. A delay in emptying beyond this period may be regarded as pathological. In general any appendix revealing a retention of twenty-four hours following the emptying of the cecum may be regarded as suspicious. According to other observers a period of forty-eight hours is regarded as pathological. Case reports an instance of retention of twenty days; but longer periods have been noted. The longer the retention, the more certain are we of disease of the appendix.

6. The usual length varies from one half to nine inches, the average being three inches. An unusually long appendix is more likely to be diseased on account of its poor drainage.

7. The appendix is normally free, when diseased it may be fixed in the iliac fossa, retrocecal, in the pelvis, adherent to the gallbladder, sigmoid, transverse colon or rectum. Fixation of the appendix is pathognomonic of a pathological state of this organ.

8. Irregularities of the lumen, if constant, are significant of disease.

9. Kinks when constantly noted suggest a pathological appendix.

10. Concretions are best examined before the administration of an opaque meal. They are always an indication of disease.

In a large percentage of cases, the appendix cannot be visualized and on this account the diagnosis must be made by means of a group of indirect signs.

INDIRECT SIGNS.

1. The cecum organ is normally freely movable, appearing as a blind pouch, lying in the right iliac fossa. It may be fixed in the iliac fossa, right pelvis, to the transverse colon, sigmoid or rectum. Fixation suggests disease or postoperative adhesions.

2. Cecal stasis is not an unusual finding and is more significant when the other portions of the intestinal tract are empty.

3. Dilatation of the cecum suggests an inflammatory process or obstruction in the region of the ascending colon or hepatic flexure due to tumor or adhesions.

4. A tender area over the cecum at the position from which the appendix arises, when the appendix is not visualized, suggests the possibility of a diseased appendix.

5. Stomach peristalsis may be normal or active. It is frequently active, the stomach being pulled down into the region of the lower right quadrant. Pylorospasm or gastrospasm are frequently noted, and occasionally six hour retention may be observed due to spasm of the pylorus.

6. A spastic colon is frequently noted in chronic appendicitis. This finding may however be due to other conditions.

7. A large percentage of our cases presented a prolapsed colon, which may account perhaps for the

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low grade inflammatory process of the appendix, possibly produced by stasis.

The appendix is best studied with the patient both in the erect and recumbent posture; special attention and care being taken to palpate and manipulate the lower right quadrant area, in order to visualize the appendix under the fluoroscope. On this account the fluoroscope offers us the best method of examination. The special points to be noted are the mobility of both the appendix and cecum, and the tender point. A film is usually made for finer detail and record. At times the appendix may be noted under the fluoroscope, yet may not be observed on the film. This is usually due to position, the appendix being overshadowed by the cecum, ileum or colon.

The terminal ileum at times resembles the appendix and may mislead the röntgenologist. We have recently noted this in one instance; a definite tender point was elicited over the terminal ileum, the appendix having been removed some years previous to the examination.

The appendix is best visualized in from six to twenty-four hours after the barium meal. Skinner states that forty-eight hours is the most favorable period for this examination. We cannot lay too great stress upon the fact that visualization itself does not always necessarily denote a diseased appendix. The röntgenologist's report in these cases must be conservative and unbiased.

The appendix arises normally from the inner and posterior side of the cecum below and behind the terminal ileum, corresponding to McBurney's point on the abdominal wall when the patient is in the recumbent posture, and is lower in the iliac fossa in the erect position.

In pathological conditions involving the lower right quadrant in which the appendix and cecum are fixed by adhesions, this relation of McBurney's point and the appendix is altered. Instead of obtaining the typical localized tenderness over McBurney's point the tenderness is elicited low down in the right lower quadrant, perhaps even in the pelvis or to the left side.

The relation of the duodenum to McBurney's point has often caused errors in diagnosis. On account of the position of the duodenum which is normally somewhat to the right of the midline, the tender point noted in duodenal ulcer may be mistaken for that of a chronic appendicitis. It not uncommonly occurs, that patients present themselves at our clinic on whom appendectomies had been performed without relief, and reveal the typical signs and symptoms of duodenal ulcer; while on the other hand it is not unusual to note that patients present symptoms of duodenal ulcer in whom upon röntgen examination the duodenal cap appears normal while the appendix is found diseased.

It is well to bear in mind that by no means can the conclusions be drawn that simply because an appendix is observed to be in a pathological state as is indicated by an x ray examination, that it should be removed. According to our observation, not until distinct clinical manifestations are observed should operation be advised.

On the other hand it is of importance to bear in mind the necessity of a routine röntgen examination in all chronic gastrointestinal affections, especially before operative procedures are undertaken in order to rule out a diseased appendix.

In a recent series of fifty-five cases in which the diagnosis of chronic appendicitis was made by means of the röntgen ray, the conclusions arrived at clinically were as follows: twenty-five cases were confirmed clinically, five of which were proved by operation; there were nineteen cases which were diagnosed as enteroptosis, three as peptic ulcers, five as gall-bladder disease, and one as colitis.

This series, though small, illustrates the fact that the clinical manifestations do not in a large percentage of cases corroborate the röntgen diagnosis. The nineteen cases of enteroptosis presented a group with vague symptoms not referable to the appendix itself. As enteroptosis is a common finding in our series, I am inclined to believe that it often predisposes to a low grade inflammation of the appendix, which may produce but few symptoms referable to the appendix.

CONCLUSIONS.

1. Röntgen examination in chronic appendicitis is best based upon anatomical and pathological findings.
2. Indirect signs are helpful, especially when the appendix is not visualized, but these should always be corroborated clinically. Insufficient röntgen signs and faulty interpretation are misleading while conservative interpretation is however of great value to the clinician.
3. Röntgen examination does not always eliminate the presence of a chronic appendicitis, and again röntgen signs of disease may be observed without clinical manifestations.
4. The presence of chronic appendicitis as noted by röntgen ray examination does not by any means always indicate the necessity for surgical intervention.

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Spriggs and Marxer: The Examination of the Vermiform Appendix by X Rays, *Lancet*, 1919, cxcvi, 91-98.

Carman, Russell D.: *The Röntgen Diagnosis of Diseases of the Alimentary Canal*, W. B. Saunders Co.

Skinner: The Röntgenology of Appendical Obliteration, *Journal A. M. A.*, December 11, 1920.

Metabolic Disturbances of Pregnancy.—Paul Rissmann (*Zentralblatt für Gynäkologie*, August 26, 1922), by analyzing the blood in cases of disturbed metabolism in pregnancy, found that the mother is deprived of calcium by the fetus and that the maternal blood is deficient in calcium in nephritis and in eclampsia. Inasmuch as the maternal blood also shows a diminished alkalinity, and as the total amount of potassium in the body is three times as great as the amount of the sodium and the amount of calcium is forty times as great as that of magnesia, the author administered sodium and potassium salts in the metabolic disturbances of pregnancy. No special diet and no rest in bed was ordered. There was no albuminuria and severe metabolic diseases (eclampsia with or without convulsions) were never observed. Most of the symptoms were either entirely cured or they were reduced in severity.

Proceedings of Societies

AMERICAN ASSOCIATION OF OBSTETRICIANS, GYNECOLOGISTS, AND ABDOMINAL SURGEONS.

Thirty-fifth Annual Meeting, Held in Albany, N. Y., September 19, 20 *and* 21, 1922.

The President, Dr. Roland E. Skeel, in the Chair.

(*Concluded from page* 595.)

Routine Treatment for Hyperemesis Gravidarum.—Dr. Edward Speidel, of Louisville, Ky., stated that a definite treatment should be followed in these cases so that improvement might be determined by the available chemical tests and where laboratory facilities were not at hand the failure of the treatment would be the indication for interruption of the pregnancy. The routine treatment consisted of the daily administration per rectum of a solution containing glucose, panopeptone, sodium bicarbonate and water. Sodium bromide and chloral were added according to indications. Every third day 500 c.c. of ten per cent sterile glucose solution was given intravenously. The glucose not only relieved the carbohydrate deficiency, but would be absorbed directly by the liver and would aid in regenerating the liver cells damaged by the toxemia, if the destruction had not gone too far. Gastric lavage was practised on the eighth day and oral administration of food was begun on the ninth. If the patient vomited in spite of this rigid régime interruption of pregnancy would be necessary.

Study of Urinary Tract of Eighty Fetuses and Infants.—Dr. George Van Amber Brown, of Detroit, Mich., stated that evidence of chronicity became apparent at an early age, even in the early months of fetal life. Bloodvessel involvement was not a constant accompaniment of luetic changes in early life. Kidney hemorrhages, both primary and secondary, were not rare in fetuses and young infants. Fetal kidney inflammatory changes might be either acute or chronic, primary or secondary, infectious or noninfectious. Malignant kidney tumors of sarcomatus nature were seen during the very early months of life. Renal calculus occurred in early life. The kidney in his opinion manufactured urine months before maturity of fetus, and probably in considerable quantity; also the fetus might develop a toxemia from retention, in its blood stream of kidney products independent of the blood stream or kidney efficiency of the mother. There apparently was a close relationship between kidney and brain in their development, and between brain and adrenals.

Renal Tuberculosis: Diagnosis and Treatment.—Dr. Henry Dawson Furniss, of New York, said that the accepted treatment for unilateral renal tuberculosis was nephrectomy, providing there was no contraindication in other concurrent disease or renal insufficiency. The earlier the disease was eradicated, the better the chances of preventing further spread and of relieving the bladder condition. With bilateral involvement some authorities had advocated removal of the kidney with the more advanced lesion. This did not seem warranted unless the better kidney had only slight lesions with good function and its ureter with the part of the bladder surrounding it was not involved. Even then, unless the patient was suffering acute renal pain, or there was vesical intolerance, he would withhold operation.

In regard to operation, the chief questions involved were drainage and treatment of the ureter. Unless there had been soiling of the wound from rupture of the kidney or persistent oozing, he refrained from drainage, and when draining, used rubber tissue for twenty-four hours for oozing. If the wound had been soiled, a split rubber tube was used for twenty-four hours or more. When there was perinephritic abscess, the kidney should be removed, if not unduly risky.

Hernia of the Female Internal Genitalia Through the Inguinal Canal.—Dr. Herbert W. Hewitt, of Detroit, Mich., said that hernia of the female internal genitalia through the inguinal canal was of relatively rare occurrence, yet it was of sufficient practical importance to justify consideration at this time. In hernia of the ovary and tube, when these were reducible and normal, they should be saved; if pathological, removal should be practised. If the hernia was irreducible the ovary should be preserved, provided it was normal and might be replaced without injury to its blood supply or without in any way weakening the herniotomy. In hernia of the uterus, between puberty and the menopause, this organ should be preserved unless there appeared to be some very good reason for its removal, while in patients at the menopause the best procedure was to remove the herniated organs. When hernia was incarcerated or strangulated, extirpation was necessary. These cases were rarely encountered.

Transplantation of Human Ovaries: Present Status and Future Possibilities.—Dr. William Seaman Bainbridge, of New York, stated that the ovarian secretion was stimulant and tonic and the sudden ablation of the ovaries in a woman before she had reached the menopause, without the substitution of an ovarian nutrient, might cause distressing mental and physical symptoms. The transplantation of ovarian tissue, either autogenous or homogenous had proved successful for both therapeutic and fertilization purposes in human beings as well as in animals. For purely therapeutic uses an implantation might be effective at any one of several sites but behind the rectus muscle where the graft would be removed from points likely to suffer traumatism, but in close proximity to the vascular and lymphatic systems, seemed the most satisfactory site. For the purposes of sterilization, where the ovaries had been removed and the uterus was intact, in a woman of childbearing age, a normal piece of ovarian tissue grafted in continuity with the Fallopian tubes or at the stump of a tube, if the tubes had been excised, might live, form follicles and ova and a pregnancy be produced from the transplanted ovary. In transplanting ovaries the closer the relationship between donor and recipient the better.

An Operation for Retrodisplacements of the Uterus.—Dr. John W. Keefe, of Providence, R. I., said that attaching the bladder to a higher position on the uterus had the effect of holding the uterus in a normal anteverted position, and of raising the anterior vaginal wall. Shortening the round ligaments by the method advocated had the advantage of retaining the original attachments of the round ligament, so that traction upon the fundus of the uterus was normally applied.

Contagious Impetigo in the Newborn.—Dr. William Mortimer Brown, of Rochester, N. Y., stated that one of the very real problems with which the administration of a maternity department had to deal was skin infections in the nursery. The susceptibility of the newly born child's skin to infection was a matter which had to be carefully considered in prescribing a standard of hygiene in the nursery. The large number of infants in one department necessitated the group method of care and economic and administrative conditions compelled the assignment of one nurse to a fairly large number of babies.

Importance of Ureteral Palpation in the Diagnosis of Abdominal Disease.—Dr. David W. Tovey, of New York, stated that normal ureters were easily palpated and it was more easy to palpate diseased ureters. Palpation of the pelvic ureters would often clear up a difficult case, the diagnosis of which seemed impossible before palpation. The nerve plexuses of the ureter anastomosed with all the other nerve plexuses of the abdominal sympathetic, so that pain from ureteral disturbance was diffuse, and might be mistaken for abdominal or pelvic disease.

Abdominal Adhesions.—Dr. Miles F. Porter, of Fort Wayne, Ind., said that adhesions which were not obstructive either to the circulation or to the lumen of hollow viscera and were not accompanied by infection were harmless. Such adhesions met with in the course of abdominal operations had better not be disturbed. Interposition of foreign substances between the viscera, either solid, liquid, semisolid or gaseous would not prevent adhesions. In the maximum conservation of tissues and general resisting powers we had the best means known today of avoiding harmful adhesions. Undue efforts to do socalled ideal surgery were to be discouraged.

Primary Sterility.—Dr. Abraham J. Rongy, of New York, stated that transuterine insufflation of the peritoneal cavity with oxygen or carbon dioxide gas, as developed by Rubin, was a very valuable aid in the diagnosis of sterility. We had no other method of examination, which so clearly demonstrated the patency of the Fallopian tubes. Once the patency of the Fallopian tubes was positively established the patient would no longer be subjected to exploratory operations on the mere suspicions that the tubes might be closed. This method of examination should be utilized in every case in which the cause of sterility was of doubtful origin. It was especially useful in patients, who had had one Fallopian tube removed because of infection or extrauterine pregnancy. By means of transuterine insufflation the patency of the tubes could be established with the least amount of traumatism to their mucous membranes. It was also employed in patients who had had plastic operations on the tubes.

Hemorrhages in the Newborn.—Dr. Lucius A. Wing, of New York, said that hemorrhages developing in the infant during birth or shortly thereafter were of greater frequency than was formerly believed. They often occurred in babies born spontaneously. Sudden or severe compression of the child's head, either by the natural forces of labor or by some obstetrical procedure, was the chief mechanical cause of intracranial lesions. Asphyxia of the infant during birth had an influence on the stability of the blood and impaired the clotting power. This rendered these infants especially susceptible to both immediate and delayed hemorrhagic lesions. Therapeutic measures to be effective in these cases should be employed early in their development.

Is Supravaginal Hysterectomy Ever Justifiable?—Dr. J. Wilson Poucher, of Poughkeepsie, N. Y., stated that he did not wish to be understood as advocating the wanton removal of the uterus or any other organs when it was not necessary. He had never observed that removal of the uterus had had any effect upon a woman's subsequent health conditions, except the complete cessation of menstruation. Removal of the ovaries or all the adnexa, if the uterus was left, did not affect menstruation, which was purely a function of the uterus. The necessity for removing an ovary should be very great.

Surgical Strategy as an Adjunct to Local Anesthesia.—Dr. Robert Emmet Farr, of Minneapolis, Minn., said that exposure and the absence of expulsive effort were the prime essentials in meeting the surgical demands in this class of cases. The abolition of the abdominal reflexes, vertical retraction, tilting of the table, combined with a negative intraabdominal pressure, the cooperation of the patient which was best obtained by solicitous care of this individual from the time he presented himself for treatment, combined with the utilization of the skill and tact of a well trained psychoanesthetist, would make it possible to perform a large amount of abdominal surgery under local anesthesia.

Surgical Treatment of Certain Puerperal Infections.—Dr. J. F. Baldwin, of Columbus, Ohio, stated that without operative intervention all of these patients died. In those rather rare cases in which the disease was practically limited to the ovarian veins, ligation of the veins above the thrombus was feasible, but the death rate, as shown by Miller, was not less than sixty per cent. Radical operation with free drainage of all the infected veins, and usually with hysterectomy, according to the results obtained in sixty-three consecutive cases, gave a death rate of a little less than thirty-two per cent.

The Defenseless Areas of the Abdomen.—Dr. George W. Crile, of Cleveland, Ohio, said that in a general way the defense of the tissues of the abdomen varied from almost one hundred per cent. in the mucosa of the intestine to almost nothing in the retroperitoneal area, where contamination slowly, but insidiously and progressively, went on to infection. In between the two lay the peritoneum, contamination of which rapidly progressed to infection, but as rapidly called into action the mechanism of defense. The adequate defense of any tissue against infection demanded an adequate nerve supply and an abundant supply of blood.

Abstracts from Current Literature

CARDIOVASCULAR DISEASE.

Endocarditis Lenta.—H. J. Starling (*Quarterly Journal of Medicine,* April, 1923) reports fifty-two cases of endocarditis lenta occurring in discharged soldiers, most of whom had been in service in France for over three years. The incidence of this disease among hospital admissions is much higher, probably two to one, for soldiers than for the civilian group during the same years, and the author believes that the physical stress of the overseas service has been a contributory cause. Previous rheumatic infection had occurred only infrequently. Starling does not think this is a determining cause, but wounds and other acute foci of infection were fairly frequent. The fact is emphasized that the disease is frequent in individuals who had previously been entirely well and of good physique, and with no history of previous illness. Positive blood cultures were obtained in only a small proportion of cases, but the diagnosis he believes may be accurately made clinically according to the criteria of Osler, Libman and others.

Quinidine in the Treatment of Auricular Fibrillation.—Archibald E. Clark-Kennedy (*Quarterly Journal of Medicine,* April, 1923) has treated forty-five unselected cases of auricular fibrillation with quinidine, and in thirty-seven (eighty-two per cent.) normal cardiac rhythm was restored. Compensation was restored as completely as possible with digitalis before quinidine was first administered. Cases of heart disease of short duration with auricular fibrillation of recent onset have reacted most successfully to quinidine. By the judicious selection of cases on the lines laid down by the author he believes therapeutic successes may be raised to a maximum, and the possibility of disaster reduced to a minimum, but the risks attending quinidine administration are pointed out.

Diagnosis and Treatment of Angina Pectoris.—Clifford Allbutt (*Lancet,* May 5, 1923) advances the following postulates: 1. Ninety per cent. of cases of angina pectoris are due to disease of the thoracic aorta, especially of its outer vestment, in which lie the sensory end organs which regulate the blood pressure. 2. The coronary arteries and myocardium have nothing to do with the pain of angina, but much to do with its mortality. 3. The death in angina pectoris is due ordinarily to vagus inhibition—that is, to the shock of the pain. In younger persons, in whom the myocardium is healthy, the heart usually survives the inhibition, so that in them, angina, as is often the case in syphilitic aorta, for example, may be a terrible, if not a fatal disease. True angina is rare in women; the socalled pseudoangina, on the other hand, is more frequent in women than in men. It seems to be a storm in the brachial plexus, intercostohumeral, Wrisberg and phrenic nerves. The angina patient is generally, but not always, pallid or pallescent; the pseudo-anginos are flushed in the face, and these patients are usually young, or not elderly, and the attacks may be determined by annoyance, the catamenial period, or other upset. The heart and pulse are not tranquil, as in angina proper, but throb rapidly, often with an irregular rhythm. Palpitation in angina proper does not occur. Between the attacks, there may be no signs of disease or degeneration; in the presence of such signs the diagnosis must be revised. The treatment recommended is that for aneurysm—absolute rest proportionate to the severity and stubbornness of the case, with due modifications of diet as may be necessary for the healing of the injured vessel.

Complete Heart Block Associated With Valvular Disturbance Without Symptoms, and Unaffected by Infections, Pregnancy, and Labor.—Walter L. Allespach and Hugh C. McDowell (*Bulletin of Buffalo General Hospital,* April, 1923) present a case of persistent, complete heart block of long standing without any symptoms referable to that condition. This is a striking illustration of the absolute comfort which is compatible with such a grave organic lesion and the withstanding all the exigencies of several infections, a pregnancy and an instrumental labor without any special cardiac disturbance. In order to eliminate the possibility of vagus augmentation, 0.002 gram of atropine was given subcutaneously twice without any effect.

Gluteal Aneurysm and Rupture Treated by Antyllus's Operation.—A. Wilfrid Adams (*Lancet,* April 7, 1923) reports a case in which a diagnosis of sarcoma or abscess was partly excluded by a sudden onset. The Hunterian and Anel operations were tried but failed. In both instances pulsation, however, was arrested temporarily. The author concludes that aneurysm of the gluteal artery should be treated by preliminary ligature of the internal iliac artery. This is in itself harmless and will control hemorrhage from the sac. The aneurysmal sac is dealt with locally according to the condition found in the buttock: 1, if the wall of the sac is ill defined, intrasacular ligature is the best; 2, if a well defined sac is present, then obliterative endoaneurysmorrhaphy is the ideal method.

Ouabaine Arnaud and Digitalis.—Oscar Ohlin (*Hygica,* July 15, 1923) reports studies on ouabaine conducted partly in Sweden but largely in Vaquez's clinic at La Pitié in Paris, the drug being widely used in France. Ouabaine contains the active principle of a strophanthus variety isolated by Arnaud and is more stable than the other strophanthus preparations and of determined toxicity. As to its indications, it is in acute dilatation of the heart, where delay is dangerous, that results are most conspicuous, as shown by rapid restoration of tonicity, raised blood pressure and increased diuresis, when given intravenously. And it is in this connection that the author comments on the efficacy of ouabaine in reactivating the heart for digitalis. Thus, in attempting to fortify by digitalis a dilated heart with complete arrhythmia, the prolonged diastole gives time for a greater influx of blood than the enfeebled heart can expel—the phenomenon of *action dissocié* of digitalis—and these are the cases where ouabaine can so restore the tone of the cardiac muscle—the diminished volume of the heart being clearly demonstrable—as to make it again responsive to digitalis. Other indications for the drug are: progressive insufficiency of left heart with rapid pulse and high blood pressure; acute dilatation of right heart in gravid women and others with mitral lesions, but never directly following digitalis; in heart insufficiency due to chronic pulmonary disease; in myocardial asthenia due to infectious diseases; in edema of various kinds, and ascites from cirrhosis hepatis. The dose for acute dilatation is 0.5 mgm. intravenously, renewing once daily for two or three days. For oral administration an alcoholic solution of one in one thousand (solubaine) is used ten to twenty drops daily for five to ten days for beginning insufficiency, while fifty to 150 drops daily are used in urgent cases. The author considers ouabaine of equal rank with digitalis as a therapeutic agent.

Familial Hypertension.—Jacob Rosenbloom (*Journal of Laboratory and Clinical Medicine,* July, 1923) presents a family tree illustrating this condition; both parents died at forty-five years from cerebral hemorrhage. Of their ten descendants, six who had reached the ages of forty-four or over had hypertension; one died from cerebral hemorrhage. Two others had high blood pressure. The two under thirty-five still had normal blood pressure, and the question is raised as to whether they will manifest hypertension between forty and forty-five. A study of the family tree suggests that heredity has produced in this group either a congenital aplasia of the arterial system, or a susceptibility to some endogenous toxic substance whose effect shows itself between the ages of forty and forty-five.

Different Forms of High Blood Pressure.—H. Kahler (*Wiener klinische Wochenschrift,* April 9, 1923) classifies the various forms of high blood pressure as follows:

A. Functional hypertensions, produced by change in the state of the contraction of the vascular musculature (increased tonus or spasm), which include, 1, those produced by central vasomotor stimulation or a change in the tonus, as follows: a; central psychic high blood pressure, which is only transient and in which it is possible that a congenital constitutional or an acquired hyperexcitability of the vascular centres plays a part and which may undergo transition into other central forms; b, central mechanical blood pressure, which is produced by increased cerebral pressure in recent apoplexies and encephalomalacias and also may occur as an exaggerated rise in other forms of high blood pressure and also in brain tumors; c, central toxic high blood pressure, which includes the bulbar hypertonia, the increased blood pressure in some uremic conditions, and also the hypertension of some patients with genuine contracted kidney; d, central lesional high blood pressure, caused by isolated sclerosis of the cerebral arteries, which is found not rarely in essential hypertonia and is the most frequent cause of cerebral hemorrhages and softenings and also in genuine contracted kidney; e, central reflex high blood pressure, which is transient in vascular crises, tabes dorsalis, and Basedow's disease and permanent in climacteric high blood pressure as well as in arteriosclerosis and in syphilitic mesoarteritis. 2. Those forms produced by peripheral vasomotor stimulation or change in the tonus include: a, the peripheral toxic high blood pressure, which is found in essential hypertonia and in congestion from high blood pressure, the latter being rare and considered as a hyperadrenalinemia because of the constantly increased blood sugar content; b, peripheral reflex high blood pressure, which occurs in uncomplicated cases of glomerulonephritis in all stages.

B. Anatomical hypertensions are produced by arteriosclerosis and are found in essential hypertonia as a result of functional (central and peripheral) hypertensions, possibly also primary, and also in the final stages of nephritis and genuine contracted kidney.

Investigations on the Immediate Effect of Heavy Exercise (Stair Running) on Some Phases of Circulation and Respiration in Normal Individuals.—Christen Lundsgaard and Eggert Möller (*Journal of Biological Chemistry,* February and March, 1923) present the first part of a study on the immediate effects of heavy exercise on different phases of the circulation and respiration in man. The oxygen and CO_2 contents of blood from a cubital vein were determined on seventeen normal subjects at rest and within one minute after running up and down a flight of stairs five times. The muscles of the arms were not used. After exercise the oxygen content of the venous blood was markedly decreased in sixteen of the individuals. The CO_2 content of the venous blood showed only small variations, being in some cases decreased after exercise, and in others increased.

The period following this exercise during which unusually low volumes for oxygen in the venous blood are obtained is of very short duration, about one to one and a half minutes. After this comes a period when the blood oxygen may be very high, almost as high as that found in arterial blood, and later on normal values are obtained. The values for carbon dioxide showed a marked decrease had taken place during the first minutes after exercise.

GYNECOLOGY.

Gynecological Operations in Relation to Life Assurance.—Arthur E. Giles (*Lancet,* May 5, 1923) finds that about seventy per cent. of patients regain normal health after operations. The highest proportion is found in cases of conservative procedures and of complete removal of organs. Unilateral operations on the uterine appendages show the lowest proportion of complete recoveries, the chances of complete cure being subordinate to the preservation of the functions of womanhood. There are disturbances of the nervous system, shown especially by the memory being affected and in most cases temporary, varying from eighteen per cent of cases where the operation was of short duration to fifty per cent in the case of long operations. There is a risk that further operations may be required, which may be put down at ten per cent, comprising direct sequelæ of the operation and independent conditions in about equal proportions. The risk is greatest after operations for inflammatory disease of the tubes and ovaries; and it is lowest after the operation of hysterectomy for benign conditions. In regard to the expectation of life in cases of operation for malignant disease, the patients must be regarded as bad risks, the possibility of recurrence varying from ten to seventy-five per cent. After operations for inflammatory disease the expectation of life is fairly good, but it is impaired by the possibility of sequelæ. Patients who have had benign tumors removed may be considered as good risks, as the chance of complications that may lead to a fatal result is negligible. The patients who have had operations that prevent further pregnancy have had an adverse factor in the expectation of life eliminated.

Chronic Endocervicitis and Its Treatment.—John William Burns (*Lancet,* October 14, 1922) believes that chronic endocervicitis should be recognized as a distinct pathological entity, apart from endometritis. Any vaginal discharge which makes the patient uncomfortable is pathological and is usually due to chronic infection of the cervical canal. As a positive culture can be obtained in ninety-two per cent. of cases of endocervicitis, the condition is infective; in fifty per cent. of cases, the staphylococcus, either alone or in association with some other organism, is present. The application of various drugs, douching, tamponade, etc., do not reach the infecting agent deep in the lumina of the glands, and therefore can give only temporary relief. Ionization will bring about marked improvement in those cases in which erosion is not present. If erosion is present the only method of curing the condition is extirpation of the lower two thirds of the cervical canal, including the erosion.

Hyperexcitability of the Smooth Musculature of the Female Genital Organs.—Erich Opitz (*Zentralblatt für Gynäkologie,* October 7, 1922) attempts to establish a new disease picture in gynecology, in which he includes many of the long continued and cramplike pains experienced by women in the hypogastrium, in the small of the back, and also in the inguinal regions and which must be attributed to spastic conditions of the smooth musculature of the genital organs. They include also the musculature of the sacrouterine ligament (posterior parametritis), the broad ligament of the uterus (dysmenorrhea), etc. Antispasmodic remedies, like atropine, papaverin, etc., exert a favorable influence upon these disorders, which frequently occur in vegetative neuroses. In many cases the presacral injection of ten to twenty c. c. of a 0.5 per cent. solution of novocaine (injected in front of each one of the sacral vertebral foramina) has given good therapeutic results.

Testing the Patency of the Tubes With the Aid of the Rubin Test.—Josef Novak (*Wiener klinische Wochenschrift,* October 5, 1922) asserts that no woman should be subjected to operation for sterility until she has been given the benefit of the Rubin test. This test affords valuable information in regard to the seat of the cause of the sterility. If the male ejaculation is found normal, if the sexual life of the female shows nothing abnormal (vaginismus, expulsion of the semen, frigidity), if the vaginal and cervical secretions are normal and the uterus of a normal size and in normal position, the cause of the sterility can be localized in the tubes and ovaries, if we exclude those cases in which the apparently normal male and female sexual products do not have sufficient affinity toward each other. If the tubes are patent, the only cause left is a deficient activity of the ovaries or an inferiority of the natural ova. The Rubin test, however, gives no information as to whether both tubes are patent nor does it indicate which one is patent if only one tube is patent. Inasmuch as both tubes usually show analogous changes in case of disease, the information gained by the Rubin test is a distinct advance. The test so far shows that in the vast majority of cases, in which palpable changes are not demonstrable in the tubes and where even the history is negative in regard to a passed salpingitis, the lesion responsible for the sterility is chronic adhesive processes in the ovaries. This test also gives valuable information regarding the prognosis and curative results in the various diseases (septic and gonorrheal inflammations during and outside of the puerperium and in febrile and feverless abortions). It is also a valuable prognostic aid.

Axial Torsion of Ovarian Cysts.—Hugo Sellheim (*Zentralblatt für Gynäkologie,* July 29, 1922) affirms that the torsion of ovarian cystomata or of pelvic tumors results from the transmission of some twisting motion of the entire body to the tumor, which lies in such a position as to be easily twisted, especially when the tumor contents are fluid. Such a motion would be a turning of the body in the upright or recumbent position. The more forceful and the more often the turning of the body and the longer it is continued, as in dancing, the more readily does the twisting of the pedicle occur; furthermore, the more fluid the contents of the tumor, the easier is the torsion of the pedicle. The author illustrates this very forcibly by turning experiments on eggs. The torsion of other organs, such as the tubes, pregnant uterus, spleen and appendix, may be explained in the same manner.

Treatment of Dysmenorrhea.—C. Menge (*Zentralblatt für Gynäkologie,* August 19, 1922) states that it is extremely difficult to cure dysmenorrhea, both the idiopathic form and that of nulliparæ with a small uterus, permanently. The author dilates the cavity of the uterus as much as possible and for a long time, with which procedure he has had good results. The entire uterine cavity is first dilated with Hegar uterine sounds up to size ten and the sounds are pushed upward to the fundus each time; each sound is then left in place for about one minute. A multiple metrotomy of the region of the internal uterine os is then done with a scissorslike instrument devised by Eymer, which is introduced into the uterine cavity closed and its blades covered, and is then withdrawn through the cervical canal in the open position, with the blades exposed. In this way the innermost layer of the uterine wall is incised circularly in about eight or ten places. The purpose of this metrotomy is to avoid the deeper lacerations in the region of the internal os of the cervix and of the entire cervical canal in the subsequent dilatation of the uterine cavity with Hegar sounds up to size sixteen. These larger sounds remain shoved up near the fundus within the uterine cavity, each for about two minutes. Immediately after the last sound has been removed, the entire uterine cavity is tightly packed with xeroform gauze, saturated in oil, up to the fundus and this is left in place for eight to ten days. The oil soaked gauze facilitates the subsequent removal of the gauze.

Etiology and Treatment of Leucorrhea.—Walter Bigler (*Schweizerische medizinische Wochenschrift,* December 28, 1922) discusses the causes of the nonspecific leucorrhea, particularly the dependence of the function of the vaginal wall upon the diseases of the internal organs. Their relationships to the acute and chronic infectious diseases, especially to tuberculosis and to the structure of the normal secretion (glycogen content, acidity) are important. The author restricts his discussion to the noninfectious hypersecretion of the cervical mucous membrane, which is usually associated with a stigmatization in the vegetative nervous system. This nonspecific fluor originates only in the vagina or cervix and never in the body of the uterus. Although the normal secretion shows no high bacterial content, there is no relationship with high bacterial contents. An endogenous factor (a readiness to inflammation) must be effective. Frequently there is only the external manifestation of an internal change: endocrine disturbance, especially in the ovary; other causes are acute and chronic general infections, diseases of the blood and metabolism and constitutional anomalies, such as infantilism and status lymphaticus or hypoplasticus. The bactericidal powers of the vaginal epithelium and blood are important protective factors. Vagotonia may be responsible for this condition. The most important factor in the treatment is the constitutional element but symptomatic treatment is also necessary. The use of sodium chloride and lactic acid irrigations seems to be especially indicated.

Excretion of Urochromogen in Gynecological Diseases.—E. Klaften (*Wiener klinische Wochenschrift,* May 11, 1922) shows that only such bodies in the urine should be designated as urochromogen as show the reaction both with permanganate and the diazo reaction, as only in this way can a definite determination be made. This view is also justified by the fact that it teaches that the body excretes urobilinogen and other indefinite chromogens and aromatic oxyacids, as well as oxyazodyes produced by certain drugs. Bodies which give only the diazo reaction but do not react typically with permanganate and alkali, must not be designated as urochromogen. Practically, it is also important to consider the reaction of the urine when testing for urochromogen and the test should be done on a twenty-four hour specimen, using no less than six c. c. of urine for the test. The urine, diluted 1.5 times, twice, etc., is mixed with two to five drops of a one in a thousand solution of permanganate; if the reaction is negative, no further examination is necessary, but if it is positive, the alkali reaction, the treatment with permanganate after a previous acidification with two to three drops of a dilute acetic acid solution should follow and the diazo reaction should be tested at all times. The author asserts that the urochromogen reaction is not specific and that its appearance in the urine is always to be considered as an expression of a constitutional affection of the organism, without regard to the etiological origin. It has also been shown that it is a valuable reaction in chronic diseases, such as tuberculosis and carcinoma, and in the acute infectious diseases, such as measles, typhoid, paratyphoid, and typhus fevers. A positive reaction in cases of severe cardiac defects, pneumonia, and other diseases is also a bad prognostic omen.

Technic of Internal Examination.—M. Traugott (*Zentralblatt für Gynäkologie,* October 14, 1922) extols the value of rectal examination in obstetrics and gynecology. In obstetrics, the rectal examination should be used when the external examination alone appears to be insufficient; if necessary, it may be supplemented by a vaginal examination. The rectal examination is harmless provided the thumb of the examining hand is kept away from the external genitals. With this maneuvre the examining finger may be passed much higher on the presenting part of the fetus, thus securing a greater palpable surface and, therefore, simplifying the diagnosis; with the vaginal examination, on the other hand, the vaginal vault is an impediment to the advancing finger and the entrance of the cervix by the finger is dangerous. The author prefers to make the rectal examination always at the height of a labor pain. If the amniotic sac is still up high, it cannot be felt. The true amount of dilatation of the soft parts is also determinable and there is no danger of rupturing the amniotic sac. If the presenting part is to be palpated when the amniotic sac is still intact, the palpation should be done at a time when there is no labor pain. If the amniotic sac has ruptured, we can determine not only the true size of the cervix, but also the turning of the sagittal suture following a labor pain at the height of the pain. The indication of an obstetrical operation by rectal examination, especially in multiparæ, is determinable only during the height of a labor pain. Another advantage of rectal examination is the fact that careful sterilization of the hand is unnecessary and also that the examinations need not be limited in number. Other things being equal, the examination during a labor pain is less painful because the pain of the examination is exceeded by the labor pain. If the possibility of mistaking the pulsation of the rectal and vaginal arteries for that of the umbilical cord is borne in mind, such a mistake will be made but rarely. Excluding cases of placenta prævia, the author made vaginal examinations in three hundred labors only in those cases where operative obstetrical procedures were necessary and has never made any important diagnostic error. He has never seen a puerperal infection or injury of the rectum or other organs in a case where rectal examinations were made.

In gynecological examinations, the author introduces the finger, flexed toward the symphysis pubis, into the vagina, and palpates along the lower border of the horizontal ramus of the pubic bone for a distance of three to four centimetres laterally from the centre of the symphysis, until he feels the pulsation of an artery; if the tip of the finger is pressed more firmly against the pelvic wall under the horizontal ramus of the os pubis, the obturator foramen will be felt. The diagnostic value of this examination is as follows: 1. Conclusions may be drawn from the abnormal diameter of the obturator foramen regarding the rest of the supporting genital organs (deficient musculature, thin connective tissue). 2. Thrombi in the obturator veins may be palpated. 3. The possibility of obtaining a nerve pressure point (neuralgia) by pressing against the horizontal ramus of the os pubis. 4. An obturator hernia can be definitely diagnosed. The vaginal palpation of the obturator foramen is possible in every case.

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DIABETES.

Treatment of Diabetes Mellitus.—O. Leyton (*British Medical Journal,* April 28, 1923) thinks that there is little doubt that insulin will prolong the lives of those patients who have only a small fraction of the islands of Langerhans functioning. The injection of insulin into a patient suffering from severe diabetes lowers his blood sugar and raises his respiratory quotient. The sugars in the blood of diabetics are not the same as in normal individuals and abnormal sugars can be converted into normal by the action of insulin along with hepatic extract. Man can live fairly comfortably on thirty grams of carbohydrate along with unlimited protein and fat. If a patient with severe diabetes be given enough insulin to ensure his utilizing thirty grams of carbohydrate he will escape the symptoms of diabetes mellitus, but his blood sugar will be above 0.15 per cent. during the greater part of the twenty-four hours, which will cause overstimulation of the small amount of pancreas which he still possesses and gradual deterioration. The final stage will be destruction of the pancreas; then the patient will have to rely for all the sugar burning material on supplies from the outside. In case these fail, life would be extremely short. This is the danger which should be avoided by strictly correlating the diet with the amount of insulin available from the pancreas of the patient, together with that injected.

Insulin and Diabetes: The Present Position.—Henry F. Moore (*Lancet,* April 7, 1923) states that insulin must be given by subcutaneous or intravenous injection, as it is destroyed by trypsin. The dose varies with the case according to the severity of the disease, the body weight, the diet, and so on, and must be controlled by frequent blood sugar estimations in each case, until one learns the amount necessary to keep the fasting blood sugar normal and to abolish glycosuria permanently. The usual plan is to divide the daily quantity into three equal parts, each part to be given just before the three chief meals. Anything from six to fifty rabbit units a day may be required and in some cases of coma one hundred and fifty units may be required within twelve hours. Adjustments in doses are often necessary, because a dose which just controls glycosuria one day may be excessive or inadequate on another. The consensus of opinion is definitely that the insulin treatment of diabetes mellitus will not replace the dietetic treatment, but will be an important adjunct thereto—at least in the more severe cases. Probably the less severe cases will not need the product at all and we shall be able, especially in the nonjuvenile cases, to control the disease by dietetic means alone. Its use, however, in the severe, the juvenile and coma cases, as well as those complicated by severe acidosis, infection and gangrene, will assuredly be a great addition to our present methods of treatment. It is questionable whether insulin should be used at all except by those who can regulate its use by blood sugar estimations, or in threatened or actual gangrene or coma; even then the danger of hypoglycemia should be understood, and suitable measures should be ready for dealing with the characteristic symptoms.

Some Problems of Diabetes Mellitus.—L. B. Winter and W. Smith (*British Medical Journal,* April 28, 1923) summarize the results of their experiments as follows: 1. The normal blood sugar of man and animals has a lower rotatory power than a, B glucose. It is probably of a reactive nature. 2. The blood sugar of diabetics is mainly d, B glucose. 3. A more complex sugar is also present in diabetic blood. 4. In the majority of diabetic cases injection of insulin causes a change in the nature of the blood sugar. The complex sugar disappears and the ratio polarimeter to copper reducing value is altered. 5. Insulin and liver extract together alter the rotatory powers of d, B glucose or d-fructose *in vitro*. 6. Injection of adrenalin into normal rabbits causes the blood sugar to be altered. It appears to become like that of diabetics. 7. An extract of yeast has an effect similar to that produced by insulin, when tested on animals and on diabetic persons. 8. Insulin convulsions in rabbits may be relieved, and the animals restored to normal, by injection of adrenalin.

Administration of Insulin by Inunction.—S. V. Telfer (*British Medical Journal,* April 28, 1923) states that insulin can be introduced into the blood stream by means of inunction. This method of administration necessitates the use of much larger quantities of the drug than those required to produce comparable effects by subcutaneous injection. However, in estimating the effects produced account must be taken chiefly of the duration of the hypoglycemia. A sudden reduction, followed by an abrupt rise in the blood sugar, such as is indicated by cases in which a relatively small amount of the drug is injected, indicates a transient effect. The ideal method of utilization would appear to be indicated by a prolonged period of hypoglycemia maintained by slow absorption. The author's results suggest that advantage might be taken of this method of utilizing crude insulin extracts. At the present time the cost of isolating the drug in a pure and active state, for purposes of hypodermic medication, is such as to restrict its application on a large scale.

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Touching for the King's Evil*

By WILLIAM RENWICK RIDDELL, LL.D., F.R. Hist. Soc., etc.

Toronto, Ontario,

The very curious custom of the sovereign "touching" those afflicted with scrofula, or the King's Evil, with a view to their cure, was continued in England until the time of Queen Anne (1). The origin and ultimate reason for this practice can now be conjectured with a high degree of probability approaching absolute certainty.

It is at length becoming generally recognized by all competent to judge that in spite of their fragmentary and disconnected character, popular superstitions and customs are by far the fullest and most trustworthy evidence we possess as to the primitive religion of prehistoric man (2). It is equally true that man is much the same everywhere, no matter what his race and what his apparent advance in civilization: what we have in common with our very remote ancestors is much more important and fundamental than our differences.

"There's such divinity doth hedge a king," said the King of Denmark (3), meaning not that a king had a guardian angel or divinity who protected him, but that there was in a king, as such, a divine nature shielding him from attack (4). He was a king *de facto* only, but that circumstances did not affect the divinity in him. In prehistoric times the adage was considered literally true, the king was the very truth, a divine being, he was a god, a man-god. Being a god, he had all the privileges as such, his person was taboo, no one might touch it without incurring the wrath of the god; his house, his clothing, his food, were all sacred (5), and anyone who interfered with anything of the king's was in deadly peril, however innocently the act might have been performed.

All this seems very strange to our modern minds, but it was not strange to the minds of our far off ancestors or to the prehistoric ancestors of any people—nor is it strange to the mind of the modern savage.

Whatever may be the causes of such uniformity—and the causes are, of course, hidden in the mists of prehistoric time—it is certain that in every region of the world, as soon as we find a nation or tribe emerging from prehistoric darkness into the light of authentic history, we find that the fundamental conception is "the solidarity of the gods and their worshippers," and that society is considered as composed not of men alone but of gods and men. The god is an actual physical father and his worshippers are literally of his stock, he is a king and his worshippers must obey his commands; the man who may become king is also a god with divine attributes and divine power. Moreover "each group had its own god or perhaps a god and goddess to whom the other gods bore no relation whatever." The modern savage in almost all instances is still in that mental state—his king or chief is a god and to interfere with him or anything of his, however innocently, is to invite the gravest consequences.

A New Zealand chief left part of his dinner by the wayside; a slave, a stout hungry fellow, found it and ate it. When informed that the food was the chief's, though he was a strong man in the prime of life, remarkable for courage and had quitted himself well in war, he was at once "seized with the most extraordinary convulsions and cramps in the stomach which never ceased till he died about sundown the same day." A Maori chief lost his tinderbox; several persons finding it used it to light their pipes and died of fright on learning to whom it belonged; "their strength ran out like water" (6). Or if death does not at once ensue, serious and even dangerous disease may follow a transgression, however involuntary. A Tongan attacked by scrofula or induration of the liver knows at once that he has touched the king or some of his belongings (7).

Fortunately homeopathy is the ruling principle in aboriginal sanitation and prophylaxis as in aboriginal medicine; and he who could involuntarily or otherwise smite with disease, could prevent the disease by touching the imperilled transgressor. The Tongan fearing that he has violated the sanctity of his king has a perfect prophylactic in touching the sole of the king's foot with the palm and back of both his hands, and if he has eaten food which he suspects to be tabooed, he sits down before the king and presses the king's foot against his own stomach; as a consequence the food does not swell up and kill him,

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*Read before the Toronto Academy of Medicine.

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and he escapes the "King's Evil" and sclerosis of the liver, all too common among his fellow subjects.

From prophylaxis to cure is but a short step; and it is most probable that a disease caused by touching something belonging to the king was cured by a touch of the king. The ruling principle of aboriginal sanitation was carried into the practice of medicine—homeopathy, like cures like (8). This will probably account for the undoubted fact that the disease known as the King's Evil and curable by the touch of the king was different in different countries. We have seen that amongst the Tongans there were two "King's Evils," scrofula and an affection of the liver. The evidence of language, which after all is frequently crystallized superstition, renders it probable that our own Aryan ancestors had the same view. Among the Romans, *morbus regius* was jaundice—Horace calls jaundice by that name in his celebrated *Ars Poetica* (9). It is quite in accord with this terminology that the kings of Hungary were said to be gifted with the power to heal jaundice (10). It is true that the appellation given to jaundice was otherwise explained: some referred it to the golden color of the skin (11); the favorite explanation, however, was that jaundice was socalled because it was to be cured by delicate remedies, royal enjoyments, *regiis deliciis* (12).

Celsus, who flourished a little before the middle of the first century, prescribed splendid dwellings, rooms, furniture, banquets, games and other more questionable pleasures which exhilarate the mind. According to him it was because these were believed to be beneficial that the disease was called regius, i. e., royal (13). Quintus Serenus Sammonicus, who probably flourished about the middle of the third century, gave the same advice and the same derivation (14). But these were physicians and physicians were and are notoriously rationalizers, and at one time, if not now, *ubi tres medici, duo haeretici.*

The other King's Evil of the Tongan is scrofula, and this disease is apparently the only one known by that name in England and France (15).

That kings down to historical times, even in the most advanced communities, continued to consider themselves and to be considered divine, is beyond question. The Emperor of Rome was "Divus Augustus," always after death and generally from the time of assuming the purple. One of them claimed and exercised the right to marry his own sister as the gods Jove and Zeus did theirs (16). The Pharaohs and the Ptolomies, Kings of Egypt, did the same, some of the ancient Pharaohs, it is said, even married their daughters; the Kings of Persia took over their predecessor's harem, including their own mother, while royal houses of Tyre and Carthage were descended from Baal (the sun) and Emperors of Japan from the moon goddess.

Nor was the gift of healing disease wanting in all. The story of Vespasian when in Egypt—the very home, indeed, of superstition as of civilization—healing a man nearly blind and another with a disabled hand—or in one version, a lame leg, was told both by such a grave writer as Tacitus and by the lighter and gossipy Suetonius (17). The blind man was cured by the saliva of the prince topically applied (18), while the halt was healed by pressure of the prince's foot, just as in the Tonga Islands.

Ælius Spartianus tells us that the Emperor Hadrian restored sight to a blind woman: the same Hadrian when suffering from a fever was touched by a Pannonian born blind and the fever at once left Hadrian while the blind man received his vision (19); and Pyrrhus, King of Epirus, by simply pressing with his foot, splenetics (then a broad term) drove out the disease instantly—but then he had on his foot a big toe mighty with divine power which after his death could neither be consumed by fire nor wasted away by time (20).

It is not to be wondered at that the Kings of England and of France laid claim to the power of curing disease—it is not on record (except in a few instances to be dealt with more particularly hereafter) that they claimed to heal more than one disease—and that, for some obscure reason, now impossible to determine with absolute certainty, was one of the royal diseases of the Tongans, scrofula.

Some assistance may be found in the superstitions of the past and of the present.

The Syrian goddess Atargatis was born of the Euphrates, as her congener Aphrodite Anadyomene was born of the seafoam. She was changed into a fish and thereafter fish were sacred to her (21), one of her types and representatives. Her worshippers believed that if they ate fish, they would be visited by boils and scrofulous ulcers (22).

For a modern example of the same thought, let us go to our own continent. The Elk Clan of the Omahas believe that they cannot eat the elk without boils breaking out on their bodies (23). The Red Maize Clan of the Omahas will have running sores round their mouth if they eat red maize. In Samoa if a member of the Wild Pigeon Clan did not use a certain kind of bread fruit leaves for plates, an eruption like chickenpox broke out over his body. Passing again to the olden times, the ancient Egyptians thought that if a man drank pig's milk his body would break out in scabs; in Japan anyone who wears the Mikado's clothes without his permission will have swellings all over the body; in Fiji there is a special disease caused by eating out of the chief's dishes or wearing his clothes, the throat swells and death may ensue (24).

There was a dispute never decided as to which of the two countries, England or France, could claim the right to prior use. French writers, e. g., the Jesuit Father Superior Gabriel Daniel, in his ponderous *History of France* (1713, new edition 1722), and Francis Eudes de Mezerai in his equally voluminous *History of France* (1643-1651, new edition 1672), as well as Andreas Laurentius (Andrew Laurence) in his *De Mirabili Strumarum Sanatione* (1609), all gave the glory to France and asserted that the Kings of England had the power from the Kings of France. On the other hand, the English claimed the original, nonderivative and first hand power of their sovereigns though, more modest, they admitted that the French kings had also original and equal power. Such were William Tooker (or Tucker), Dean of Lichfeld, a divine of the sixteenth century (25) whose *Explicatio totius Quæstionis de Mirabilium Sanitatum Gratia, in qua præcipe agitur de Solenni et Sacra Curiatione Strumæ* . . . "London, 1597, is an elaborate historical defence of the power of the English kings in curing the King's Evil. John Brown (or Browne), surgeon in ordinary to Charles II and surgeon of St. Thomas's Hospital, London (26), a prolific writer on matters surgical, who wrote *Adenochciradolagia,* an "anatomical chirurgical treatise of granduls and strumes or King's Evil swellings, together with the royal gift of healing by imposition of the hands of our kings of England and France," London, 1684, and many others.

In France we are told the power was conferred by direct gift from heaven upon Clovis the first Christian king "upon his being anointed with the Holy Chrism from which he and his successors obtained the title of 'Most Christian' and with it the power of healing scrofula" (27). Other writers say that Philip I, contemporary with Edward the Confessor, was the first who touched (28), and it is added that he was afterwards deprived of the healing power on account of the irregularity of his life (29). Louis the Fat touched successfully using the sign of the cross" (30).

In England, the common account is that Edward the Confessor (1042-1066) was the first to possess or at least to exercise this power—but there is nothing extant affirming this until the *Gesta Regium* of William of Malmesbury, first published in 1120, fifty-four years after the death of King Edward (31). Before going into the story concerning the cure of scrofula, it will be well to dispose of the exceptional cases referred to above.

William of Malmesbury in his *Chronicle of the Kings of England,* says that Edgar, who came to the throne in 959, sedulously procured the divine love by his devotion; his sanctity was so manifest that "no king either of his own or former times in England can be justly and fairly compared to Edgar." The historian then relates that when Abbot Ailward of Glastonbury opened his tomb in 1052 and found his body untouched with corruption, he profaned the royal corpse by cutting it to fit it into the too small receptacle he had prepared for it. Thereupon "the blood immediately gushed out in torrents. . . . The violator of the sacred body presently became insane and shortly after broke his neck going out of church. Nor did the evidence of the sanctity of the king stay at this, it proceeded further, a man, lunatic and blind being there cured" (32). It is, however, apparent that these miracles were wrought not by Edgar, the king and *quâ* king but by Edgar the saint *quâ* saint; and they do not differ from the miracles at the tombs of other saints in the early and middle ages.

The same remark may not be applicable to the curing of the blind by a king more holy and celebrated than Edgar and who came to the throne nearly half a century after Edgar's death. Of Edward the Confessor, King of England from 1042 to 1066, William of Malmesbury says that he cured six men wholly blind and one man with one eye. The account reads suspiciously like that of Vespasian's cure of the partially blind man in Egypt; but all such marvels have a family resemblance (33).

As to the insanity cured by Edgar, in ancient times, insanity was a well known punishment for sin against the god—the same thing is found among certain tribes to this day (34), and the name is legion of those who were blinded for looking upon a god or upon what was forbidden—from Tiresias who saw the virgin goddess Pallas Athéné in her bath to Peeping Tom of Coventry, who risked both eyes to view the Lady Godiva when she rode through Coventry, clothed only in her beauty and goodness, to secure from her husband, Leofric, Earl of Mercia, a remission of the heavy tax he had imposed upon the people of that ancient city.

These miracles of curing the blind were not continued in the after history of England and I leave them to pursue my main theme, namely, the cure of scrofula.

The account given by William of Malmesbury is the fount from which all others spring. Several historians before him had written the life of King Edward the Confessor—Ingulphus, Abbot of Croyland (1030-1109), who was in the prime of life at the death of the king and who wrote his *Historia Anglorum,* still extant, and Florence of Worcester (? -1118), who lived about the same time and who wrote his *Chronicon ex Chronicis* founded on the earlier Chronicle of Marianus Scotus, a learned and pious Irishman who died 1083 or 1086—none of these mentions the healing power of Edward the Confessor, nor is it attributed to him among his gifts and virtues—*Signa ac virtutes* in the Bull of Canonization of Pope Alexander III.

William says: "Next, I shall now speak of miracles—a young woman having a husband of nearly the same age but without fruit from the union had contracted a loathsome disease—the fluids gathering to excess around her neck and the glands swelling, she was a shocking spectacle. Commanded in a dream to ask the King to wash the parts, she comes to Court and the King himself performing the labor of piety, strokes the neck of the woman with his fingers dipt in water; joyous health follows the healing hand, the lethal scab is dissolved, so that, worms flowing out with the sanies, the whole noxious tumor itself subsides. But as the mouth of the ulcers was foul and patulous, he ordered that she should be supported out of funds of the Court until perfect recovery. Strange as it may seem, it is nevertheless true that before a full week went by a beautiful skin returned without cicatrix, so that you could distinguish nothing of the former disease. A year after, she bare twins and thereby increased the miracle of the holiness of Edward" (35).

This has always been considered a case of the cure of scrofula and notwithstanding the silence of other biographers and historians, I can see no reason to doubt the truth of the story. I venture to think that a flood of light is shed on the whole subject by William's next sentence: "Those who knew the King's life more intimately say that he cured this disease many times in Normandy. Consequently some in our times who assert the power of curing this disease proceeds not from personal holiness but from heredity of the royal family have a false view of the fact" (36).

William claims to state facts of his own time from his own personal knowledge and this claim has always been considered justified. It therefore seems to me that the passage quoted above proves conclusively that it was generally recognized at the time at which he wrote that the kings, or at least some kings of England, had the power of healing scrofula, and a current view was that this power came from royal descent. The conviction that such power existed did not arise for the first time in that age; it must, I think, have been an existing traditional belief handed down, as all such beliefs are handed down from remote antiquity. While it cannot be said that there is any available evidence to prove it, I am confidently of the opinion that the Saxon and Danish kings, predecessors of Edward the Confessor, the Kings of the Heptarchy and the Saxon, Jute, Angle, and Danish chiefs, who preceded them, all exercised the healing gift. Perhaps, it was so much a matter of course that it was not thought worth while to say anything about it: writing was an exceedingly rare accomplishment in those ages, and the printing press was far in the future.

William was a monk and naturally magnified his church and her faithful members. He attributed the royal gift of healing to personal sanctity, which, it must be remembered, consisted, according to his view, in devotion to the church and her ministers and services. He combatted the view of those who thought this magic power was inherent in one of royal descent. Remembering that he wrote in the times of Henry I. and that the English had not been reconciled to Norman rule, it is probable that the absence in the ruling king of the power to cure the King's Evil—we have nothing to indicate that any of the Norman kings even attempted to exercise the sacred power—was used as an argument by the dissatisfied Saxons against the right of the king to rule over them. Already the contention that the possession of this power was an argument in favor of pretension to rightful occupation of the throne, as its absence the reverse, was current among the people of England as it was centuries afterwards. The other explanation, namely, that the Norman Kings, William the Conqueror, William Rufus, and Henry Beauclerk, actually did touch for scrofula and successfully, and that their adherents adduced this fact as evidencing their lawful sovereignty seems to be contraindicated by the circumstance that William of Malmesbury living during their reigns makes no reference to any such touching, although he carefully details the miracles of their predecessor, Edward the Confessor. Whatever may be the explanation, it is obvious that there were two theories, the one ecclesiastical, attributing the power to the personal holiness of the monarch—the other (which was that in later times adopted by the Stuarts and their partisans) that it was due to the descent from rightful Kings and therefore to occupancy of the throne by right of birth. Neither, I think, was the original view, that of Hamlet's uncle, the fratricidal King of Denmark, that the power was inherent in the King *de facto*.

It may be added that Sir John Fortescue, Henry VI.'s Chief Justice (1442), in his treatise *De Naturâ Legis Naturæ,* written in favor of the title of the House of Lancaster against that of the House of York, argued that the Crown could not descend to a female because the Queen is not qualified by the form of anointing her, at the Coronation, to cure the disease. The Yorkist, Edward IV., derived his claim to the Crown through two women—his mother, Anne Mortimer, and her paternal grandmother, Philippa, daughter of Lionel, Duke of Clarence, second son of Edward III. while the Lancastrian Henry VI. claimed by an unbroken descent in the male line through Henry V. and Henry IV. from John of Gaunt, third son of Edward III. The Yorkist claim is in accord with our present view. A similar argument to that of Fortescue was long after advanced by Nonconformists against the Church of England, that is, that it was against the law of God that a woman should be above man in a church as the Queens of England were in the Church of England—the Church of Rome being much more scriptural in that regard. See, e. g., a very curious 12 mo., Boston, Mass., 1768, *A Dissent from the Church of England,* pp. 27-29, 158-161, 280-285. But Fortescue and the Dissenter both failed—Providence was as usual on the side of the heavier battalions.

To return to King Edward the Confessor; that he had the miraculous gift as asserted by Shakspere in the well known and oft quoted passage in Macbeth. But it must be remembered that this play was written in the early years of the reign in England of James I. (37), who was also James VI. King of Scotland, and James was notoriously very insistent upon his divine right to rule, derived from his royal assent—Shakspere's verses may be confidently taken as written in compliment to the king. Malcolm, who had fled from Scotland and taken up his residence at the Court of Edward the Confessor, inquires of the physician (38):

"Comes the King forth, I pray you?
Doct. Aye, sir: there are a crew of wretched souls,
That stay his cure: their malady convinces
The great assay of art; but, at his touch,
Such sanctity hath heaven given his hand,
They presently amend.
Mal. I thank you, doctor.
(Exit Doctor)
Macduff: What's the disease he means?
Mal. 'Tis call'd the evil:
A most miraculous work in this good king;
Which often, since my here remain in England,
I have seen him do. How he solicits heaven,
Himself best knows: but strangely-visited people,
All swoln and ulcerous, pitiful to the eye,
The mere despair of surgery, he cures;
Hanging a golden stamp about their necks,
Put on with holy prayers: and 'tis spoken,
To the succeeding royalty he leaves
The healing benediction. With this strange virtue,
He hath a heavenly gift of prophecy;
And sundry blessings hang about his throne,
That speak him full of grace."

It is of great interest to observe the method of cure. The fingers are dipped in water and then the neck is stroked with the wet fingers. The use of water to anoint the sores seems to be an evolution from that of saliva which was used by Vespasian and others, which use is almost certainly aboriginal. Andreas Laurentius, professor of physic at Montpellier and chief physician to Henry IV. of France, informs us that that king employed his saliva; this was at the end of the sixteenth century (39).

The saliva is by many savage tribes considered to be a part of the man whether he be an ordinary individual or a king or mangod. The saliva of a king is something to conjure with; on the Slave Coast of Africa, in Senegambia, in Ashantee, on the Congo, and in many other parts of the uncivilized world, the greatest care is taken not to allow the saliva of a chief to get into wrong hands (40). There can be little doubt that our Aryan ancestors had the same superstition. The saliva, then, was sacred and had a magic healing power (41).

Indeed, almost anything touched by the king received this mystic gift. The water in which Edward the Confessor washed became holy and shared with him his power to heal the blind, and the water with which his fingers were wetted became equally efficient.

The stroking with the hand is of immense antiquity among many nations (42). We have no record of "touching" in the reigns of the Norman kings, whether they feared a failure by reason of their not coming to the throne by hereditary right, or by reason of their contempt for the superstition, as in the case of Cromwell and William III. in the seventeenth century, or by reason of their unpopularity among the common people. We shall see that the numbers "touched" during Stuart times were almost in proportion to the popularity of the king.

Stephen of Blois and Matilda were, perhaps, too busy to pay attention to such a trifle as the health of the populace; but there seems to be no doubt that Henry II., the first Plantagenet King of England, exercised or at least claimed the gift or had it claimed for him. Peter of Blois (Peter Blesensis), his chaplain, Archdeacon of Bath and later of London, one of the most learned of medieval writers, and one of King Henry's most trusted servants, says of this king, "Not in vain did he receive the sacrament of royal unction of the efficiency of which, if it is unknown or comes in doubt, the disappearance of imaginary disease and the cure of scrofula will supply the fullest proof" (43).

There is no known account of the exercise of this power by the other Plantagenets until Edward I., who is said to have healed 182 persons. That all the kings of England had and exercised this gift, we have the evidence of the celebrated Polydore Vergil in his *Anglicæ Libri xxvi.*

The following is his statement: "King Edward (i. e., the Confessor) by divine gift was accustomed by touch alone to heal the strumous, that is, those suffering from struma. Struma is the disease which Italians in common parlance call scrophula, from scrofæ (i. e., swine), which are afflicted with this evil complaint. It is a humour in which certain deep seated glandlike concretions arise, formed of pus and blood; it creeps through the neck and chest for the most part. A certain perpetual gift flowed as of hereditary right to the later kings, for even now the kings of England cure the strumous by touching them after certain hymns have been recited and ceremonies observed" (44).

It is rather difficult for the modern physiologist and pathologist to enter into the mind of his medieval brother without a full understanding of his terminology. "Humours" were the fluids of the body, real and imaginary, necessary or factitious, natural or pathological; it was upon the due condition, relation, preponderance, "crasis," of the several humours that health and life itself depended. Polydore Vergil did not write until the sixteenth century, however, and his Historia was first printed at Basle in 1534. Writing two hundred years after the event, the accuracy of his information has been much doubted, and even when supported by Hussey it may not be wholly certain.

That Edward I. coined the angel or angel noble (45), a gold coin of the value of 6s. 8d., and gave it to some affected with the King's Evil, there seems to be little if any doubt, and the probability is that this coin was given to those touched for the King's Evil in lieu of the maintenance at the royal expense of the sufferer until fully cured which Edward the Confessor furnished to his patient. The angel was in purchasing power the equivalent of about $50 at the present time.

When we get to Edward III. we are on absolutely firm historical ground. That king claimed the throne of France through his mother Isabel of Valois, and he apparently believed that his claim would be strengthened by the exercise of the power of healing which admittedly was vested in the Valois kings by reason of their descent from St. Louis (Louis IX.) of France. However that may be, he instituted public healings. At these he is believed to have washed the diseased parts with water and given each patient a noble, or according to some accounts, a "touch piece" then for the first time coined (46). The ceremony, simple as it was, was a religious one and accompanied with prayers (47), but there was no formal ritual prescribed, so far as is known.

The practice established by Edward III. was followed by succeeding monarchs, Plantagenet, Lancaster and York, but the first Tudor, Henry VII., made a change. As in the case of Edward III.'s doubtful claim to the crown of France, Henry Tudor's doubtful claim to the crown of England required all the help available. Bosworth Field gave him the throne, his marriage with Elizabeth, daughter and heiress of Edward IV., confirmed him in his seat, but it required all his undoubted ability to secure his retention of it. With all his civil and military skill, the insurrections of Lambert Simnel and Perkin Warbeck showed the danger with which he was constantly surrounded. Divine power evidencing his right to the throne could not wisely be concealed and Henry determined to make much of it. He caused a service in Latin to be prepared —"Ceremonies for the Healing"—and thereafter the simple form of washing the tumors with water was discontinued and a more elaborate and formal ceremony followed (48): "This new ritual was in Latin, the rubric being in English, and was taken partly, with some alterations, from two forms in use in the Roman Catholic Church, the blessing for sore eyes, and the *Exorcismus adversus spiritus immundos.* After confession and absolution, the first Gospel, the same that was ever after retained, was read; during which the sick people were presented by the Clerk of the Closet and touched, the king laying his hand upon the sore places, and were afterwards led away by the surgeon. During the reading of the second Gospel the sick were again presented singly; the sore, or the patient's neck, was crossed with an angel noble, which was then hanged about the patient's neck, to be worn (in the words of the rubric) till they were "full whole." A collect was then said for the sick, the chaplain first saying, *Sit nomen Domini benedictum,* the king answering, *Ex hoc, nunc, et usque in seculum.*

Domine, exaudi orationem meam,
Et clamor meus ad te veniat.

Oremus,—Omnipotens sempiterne Deus, salus aeterna credentium, exaudi nos pro famulis tuis, pro quibus misericordiae tuae imploramus auxilium, ut reddita sibi sanitate, gratiarum tibi in Ecclesia tua referant actiones. Per Christum Dominum nostrum. Amen. And the service concludes with a longer prayer, also in Latin, "to be said secretly after the sick persons are departed from the king, at his pleasure." (48.)

The same form was used by Henry VIII. and Edward VI., but both Queen Mary and Queen Elizabeth made slight changes: "The form used by Queen Elizabeth began with the first Gospel; during the reading of the eighteenth verse, the sick were touched, and retired till the Gospel was ended. The second Gospel was then read; during the reading of the ninth verse, the sick were again presented to receive the golden angel, the queen first marking, as did her predecessors, the seat of disease with the sign of the cross, praying for them and blessing them. The queen and the whole congregation, kneeling, then pray,

Kyrie Eleison
Christe Eleison,

The Lord's Prayer followed, and after it the versicles and responses used in English by Charles II. This prayer was then said, varying a little from those used by Henry VII. and Charles II. Omnipotens Deus, aeterna salus omnium in te sperantium, exaudi nos te precamur nomine famulorum tuorum hic presentium, pro quibus misericors auxilium tuum imploramus ut salute accepta tibi gratias agant in sancta Ecclesia tua per Jesum Christum Dominum nostrum. Amen. The congregation were then dismissed "usitata formula" (49).

Queen Elizabeth had healings very frequently, many thousands being cured by her; it is said the number amounted to three or four hundred a year. Among those touched by Queen Elizabeth was, it is said, a Roman Catholic. He had failed to obtain relief from medicine and as a last resort applied to the queen. Her cure convinced him that Elizabeth was rightfully queen and the Pope's excommunication was ineffective (50). This unfortunate was in prison where he was attacked by the disease. Failing of cure by physicians he applied to the queen and was cured by her touch, but as he was at the same time cured of recusancy, the genuineness of the bodily cure may be doubted. Elizabeth, however, used the sign of the cross and some Roman Catholics attributed the healing to that holy sign, and not to any virtue proceeding from the queen herself (51). It appears that this queen discontinued the practice for a time but if she did she returned to it, and exercised it very frequently and successfully (52).

The sign of the cross was objected to by many in the reign of James I, the first Stuart King of England; the contention of some Roman Catholics, mentioned above, that it was the sign of the cross which had the mysterious healing power gave ground for thought to Protestants and soon James practically discontinued it and ordered it to be expunged from the ritual. It is recorded that the "cure . . . proceeded as effectually, that omission notwithstanding, as it did before" (53). James I and his descendants made much of the "touch" as evidence of divine right to the throne, and if ever a king had a questionable title James was that king—his family had been excluded from the throne by statute and by the will of Henry VIII, his mother, Mary Queen of Scots, had been executed for treason by Queen Elizabeth, and he had been born an alien. As has been well said: "The weaker the sovereigns became, the more solicitude they showed about their title" (54). James undoubtedly believed in the doctrine of the divine right of kings and the Tory party (not as yet dubbed with that name, for the name was not adopted until about 1620) the Cavaliers and the Jacobites, adopted it to the full extent. The gift of healing was one, and a most valuable one, of the indicia of the divine right to the throne: and James and his descendants, kings of England, made the most of it—they did all in their power to encourage "a superstition so politically useful" (55). As we have seen, Shakspere catered to this doctrine of the king in his marvelous *Macbeth,* and the fulsome and nauseating flattery of the translators of the *Bible* shows how far the most intelligent and learned were prepared to go in adulation (56).

The crowds flocking to be healed caused James to issue a proclamation warning off those with contagious diseases (57). "Charles I caused an English form of service to be composed and touched many persons —seventy it is said on a single day at York" (58). The great number of patients had made it necessary to have fixed times for "Healings"; and accordingly stated seasons at Easter and Whitsuntide were provided. These functions were not always in London: Hussey records "Healings" by Henry VIII at Langley, by Elizabeth at Kenilworth, by James I at York, and later by Charles II at Newmarket and other places, by James II at Bath and Banbury, and by Queen Anne at Bath and Oxford (59). We shall see that Charles II sat at the Banquetting House when in London.

Care had to be taken of the sovereign's health. We find in the time of Charles I, a proclamation substituting Michaelmas for Whitsuntide as "more convenient both for the temperature of the season and in respect of any contagion which may happen in this near access to His Majesty's sacred person." This referred to the epidemics frequently prevailing, and the plague and smallpox are specifically mentioned (60).

If not sooner, certainly in the reign of Charles I, the practice was to issue a proclamation fixing a day for a public holiday, and on that day the ceremony proceeded at which all, young or old, rich or poor, and of all nations, might attend. It is said that James I actually touched the son of the Turkish ambassador at the father's request and to such effect that on taking leave of the king the ambassador thanked him for the cure effected (61).

Charles I was executed and the next ruler, king in all but name, was requested to "touch," but Oliver Cromwell refused. It was indeed reported that he had tried but failed. This, however, was a calumny invented by the Royalists when Charles Stuart, son of the dead king, was practising his royal gift at Bruges (62) and elsewhere.

There is no possible doubt that Charles II touched before he came to the throne. "It is certain that the king hath very often touched the sick at Breda, where he touched 260 from Saturday the 17 of April to the 23 of May, as at Bruges and Bruxel, during the residence he made there, and the English assure . . . . that it was not without success, since it was the experience that drew thither every day a great number of those diseased even from the remote parts of Germany" (63). Charles II was a superb politician. There is now no doubt that his chief desire was to reestablish the ancient faith in England but he was determined not "to go on his travels again," and he steadily and constantly courted popular favor on all occasions and by all means at his disposal. When in 1660 he was restored he was only too willing to meet the public expectation of a revival of the rite—the custom was undoubtedly popular during his reign and that of his successor James II. Charles arrived in England late in May 1660 and within a month began to touch for the evil in London. In Samuel Pepys' *Diary* we find the following under date of June 23, 1660: "So to my Lord's lodgings where Tom Grey came to me and staid to see the King touch the people for the King's Evil. But he did not come at all, it rayned so; and the poor people were forced to stand all the morning in the rain in the garden. Afterwards he touched them in the Banquetting Hall" (64).

Curiously enough John Evelyn, the other celebrated diarist of the period, does not seem to have heard of this touching. The first entry in his *Diary* is of date July 6, 1660. "His Majesty began first to touch for the evil, according to custom, thus His Majesty sitting under his State in the Banquetting House, the chirurgeons cause the sick to be brought or led up to the throne where they are kneeling, the King strokes their faces or cheeks with both his hands at once, at which instant a chaplain says 'He put his hands upon them and he healed them.' This is said to everyone in particular. When they have all been touched, they come up again in the same order and the other chaplain kneeling and having angel gold strung on white ribbon on his arm, delivers them one by one to His Majesty who put them about the necks of the touched as they pass whilst the first chaplain repeats 'This is the true light who came into the world.' Then follows an Epistle (as at first a Gospel) with the liturgy, prayers for the sick with some alteration, lastly the blessing; and then the Lord Chamberlain and the Comptroller of the Household bring a basin ewer and towel for His Majesty to wash" (65).

The quotation from Evelyn gives the ceremony followed by Charles II early in his reign: he subsequently made a slight change in the office, and this was followed for the remainder of his reign.

Before giving this form, however, it is well to note that as early as Queen Elizabeth's time, it had been the duty of the royal surgeons to cover any offensive ulcer with a plaster which would conceal the sore although itself with no medicinal qualities. The touched receiving a touch piece of substantial value, when the practice of giving a gold angel noble came to an end, these pieces often found their way to the market and there were frequent instances of the same person presenting himself more than once with a view to obtaining this valuable gift. Consequently, at the very beginning of the reign of Charles I a proclamation was issued on June 18, 1626, requiring a certificate from the minister and church wardens that the applicant had never before been touched (66). This was not wholly effective, certificates were obtained with too great facility with or without improper inducements, and it was found necessary to give more stringent instructions. In the very last month of the reign of Charles II, January, 1683, a new proclamation was issued requiring "all ministers and church wardens to be very careful to examine into the truth before they gave such certificates, and also to keep a register of all certificates they shall from time to time give" (67).

After this proclamation, there were many entries in the parish registers of such certificates being granted (68) but it is almost if not quite certain that many were granted of which no record was kept. The certificate was brought by the patient "to the surgeon in waiting at his private residence. He examined the patients to satisfy himself of the existence and real nature of the disease and countersigned the certificates or gave other tickets to admit to the healing; and it was his duty to acquaint them with the day appointed for the ceremony" (69). The number of those coming up for healing was increased by the practice of some parishes in granting money to assist their sick to London or elsewhere where there was a healing, or conveying them thither at the expense of the parish (70).

The new ritual and ceremonies prepared early in the reign of King Charles II, are as follows (71):

"The Clerk of the Closet, generally one of the Bishops, had charge of the gold distributed at the Healings, and was a check to the surgeons. Under him with the Closet Keeper, who kept a register, under the hand of the chief surgeon, with an account of the numbers who were healed, and received medals; he also gave a receipt to the exchequer for the gold received. He attended the Healings with the gold on his arms ready strung, and presented it to the Clerk of the Closet."

The day being come, which was usually a Sunday, or some other festival, the time generally after morning prayer, the chief officer of the Yeoman of the Guard places the sick people in convenient order. The king enters his chair uncovered, being surrounded by his nobles and many other spectators. One of the chaplains in attendance then begins the Gospel, taken from the last chapter of St. Mark, at the fourteenth verse—the Gospel appointed for Ascension Day. At the eighteenth verse "They shall lay their hands on the sick and they shall recover," the surgeons in waiting, after making three obeisances, bring up the sick in order. The chief surgeon delivers them one by one on their knees to the king, who applies his hands freely round and about their necks; which done, the other surgeon receives the patients from him, and passes them on, to be brought up again to receive the gold.

(*To be continued*).

Lipodystrophia Progressiva Superior

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Cases falling into this particular clinical category have been described under a variety of names, but the one clinical term that appears to be generally accepted is that of lipodystrophia progressiva and was suggested in 1911 by A. Simons (1) in his description of this unusual condition.

The first case was published by Barraquer (2) in 1906 and in 1907 Harry Campbell (3) exhibited a typical case before the Clinical Society of London, and this exhibition received a considerable degree of attention. Cases have come from every section of the civilized world. H. L. Smith (4), of Baltimore, in his review of the literature published in 1921, concludes that there are records of twenty-seven well defined cases, twenty-one in females.

Smith gives a report of a case in a female aged thirty-one years and adds a biopsy report giving a microscopic record of the skin changes present. A microscopic study of sections of the skin and the subcutaneous tissue taken from the emaciated areas of living patients has also been recorded by Simon, Feer, Christensan and Weber, and in every instance the absence of fat was a conspicuous factor. Campbell and Feer have mentioned a peculiar odor of the skin.

I have been able to collect from the literature twenty-eight additional cases and am contributing two from my own private practice, bringing the total number of authentic case reports to fifty-eight.

CHARACTERISTICS.

The characteristic clinical features of lipodystrophia progressiva consists in a slowly advancing, symmetrical disappearance of the fat from the subcutaneous tissues (panniculus) of the face, head, neck, upper extremities, trunk and abdomen, as low as the crests of the ilia and upper boundary of the pelvis. Hand in hand with this progressive loss of fat from the upper portions of the body, the hips, thighs and limbs remain normal in size or show an appreciable, progressive increase in dimensions.

Cases furnished by the literature show that approximately one half of them do not conform closely to the foregoing clinical outline, but display many features in common. Limited areas of lipodystrophia, as shown by extreme emaciation of the face, neck or thorax, have been described at length by Betty Shaw (5), Hustler (6), Weber (7), Herz (8), and Johnson (9).

These atypical cases are most often found in male subjects and show considerable variation in the parts of the body displaying fat atrophy. Lewandowsky (10) reported a case with involvement of the face and trunk, while the arms were unaffected. Boissonas (11) and Herman (12) have cited cases where there was no apparent loss of the fat in the abdominal walls, and Laignel-Lavastine (13) and Ward report a case without involvement of the face.

Bignami, cited by Zella, makes mention of a singular observation in a case of lipodystrophia in which there occurred progressive atrophy of the subcuticular fat of the face and upper extremities, also foci of necrosis in the subcutaneous fatty tissues of the lower extremities. The disease in this case began as a nodular tumefaction of the skin, over which there was a change in color to a cyanotic hue, with slowly progressive atrophy. Zella includes as authentic cases reported by Cockane, Lewandowsky, and Laignel-Lavastine.

Lipodystrophia progressiva superior has been suggested as the best clinical term by Gerhertz (14). Some of the case reports refer to the buttocks and lower extremities, as showing an excessive accumulation of fat. One of my patients had reached the age of thirty years, and her hips, thighs and legs appeared enormous in comparison with her emaciated abdomen, chest, and arms; but I take it that this woman's lower extremities were not out of proportion with what the upper parts of her body should be at her age. The lower extremities of this patient are practically the same size as those of her older sister. Illustrations are on record showing many features of asymmetry in different parts of the body. The feet and ankles appear to have escaped involvement.

The clinical description of all cases harmonizes so closely that I am inclined to believe that lipodystrophia progressiva superior will be found more commonly when the profession becomes better acquainted with the clinical phenomena characterizing this malady.

SYMPTOMATOLOGY.

Most of these patients express a general sense of good feeling. Their chief symptom is that they become tired after exertion. The majority of them are forced by their friends to consult a physician on account of their emaciated appearance. These patients may be regarded as eccentric and they display an extraordinary degree of determination. The mind is clear, they are of average intelligence, and the patients I have seen were possessed of exceptional memory.

It is fair to assume that the causal factors in all cases of lipodystrophia, whether typical or atypical, are more or less closely identical. The literature appears to furnish little regarding etiology. Some writers have suggested that it is probably of endocrine origin, while others refer to it as hereditary, some cases having developed after severe fright, while others had as a precursor some acute infection, such as measles, scarlet fever, whooping cough, and other conditions.

A detailed x ray study of the bony structures and the hollow viscera has given negative findings. There are, however, a few reported cases where abnormality of the sella turcica existed. Thus far I am aware of two postmortem reports, but these do not throw any light upon the etiology of lipodystrophia.

Case I.—Miss X, aged thirty-one years, single, height five feet one inch, weight eighty-six pounds. Born in the United States and had always resided in the vicinity of Philadelphia. Saleswoman by occupation. As a child she was rather stout and enjoyed perfect health, until the age of twelve to fifteen years, when friends noticed that her face was becoming unusually thin. This condition did not appear to incapacitate or annoy her until she reached sixteen, when a growing thinness over the upper portion of the chest, shoulders and arms was apparent. Her condition had continued the same as at present for many years. Extreme tiring after moderate exertion was experienced at the age of twenty-five, and her work had become a burden. She was more or less nervous, and experienced dull pains in the lower extremities and through the arms. Sleep did not rest her, although she appeared to sleep well.

There was an unusually heavy growth of black hair over the scalp and a tendency for the hair to extend in front of the ears. It had been cut on several occasions but the growth and amount of scalp hair was extraordinary. Hypertrichosis was seen between the shoulders, where there was a considerable growth of hair, and at the pubic region the female arrangement of the hair was maintained, and likewise the growth heavy. There was a decided growth of hair below the knees, particularly on the calf muscles and this growth extended to the ankles. An uncommon growth of black hair was seen over the forearms, extending to the wrists and backs of the hands. I make special mention of this hypertrichosis because I have not found a case report in the literature where it has been given due clinical consideration.

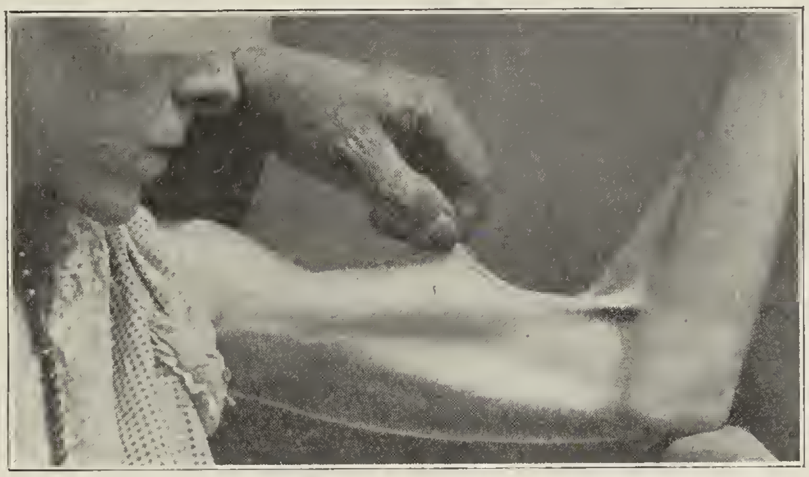

Fig. 1.—Case II. Note the folds of thin skin that can be lifted from the muscles of the arm, and the absence of fat from face, neck, and arms.

Bony structures of the head were normal. Viewing the face from the side, there was to be seen marked depression in front of the ears. The malar bones rose high and there was a pronounced depression around each. The orbits were so prominent that it gave the eyes a peculiar sunken and almost cadaveric appearance. The eyelids were normal, yet the patient did not wink as frequently as was customary in health.

The inferior maxillary and neck regions showed an equal degree of emaciation, and when the patient tilted her head from side to side the sternocleidomastoid muscles stood out conspicuously. The supraclavicular regions were depressed, only as the result of fat atrophy.

When the patient was sitting or standing and one looked underneath the lower jaw, it was noticed that there was an inverted craterlike depression from the margin of the lower jaw toward the base of the tongue. In no other cases of extreme emaciation that have come to my notice has this craterlike appearance been so prominent as it was in this case of lipodystrophia.

The shoulders, arms and hands shared in the extensive degree of fat atrophy. When the patient shut her hand tightly, and contracted the biceps, the muscle stood out prominently and gave emphasis to the absence of fat in the panniculus or subcutaneous cellular tissue.

Measurements of the left arm over the biceps muscle eight inches, near the elbow six and seven eighths inches, at the wrist five and one eighth inch. The right arm gave measurements slightly less than those of the left, which was due to the fact that the patient used her left arm the more. Fat atrophy, while extreme in both arms, appeared to be slightly more advanced in the right than in the left hand. The right hand at the thumb was seven and three quarters and the left eight and one half inches. The palms of the hands were cupped shape.

The chest showed extreme emaciation, which extended to the crests of the ilia, where the fat atrophy appeared to end rather abruptly. Chest expansion was three and one half inches and there was nothing abnormal, except the prominence of the muscles and the depressed interspaces.

The mammary glands were of normal size, but were not covered with fat tissue and on account of the absence of fat, the skin over these glands was shiny, but the gland hung in the manner characteristic of the gland of a woman who has borne many children. Surrounding the nipple was a complete ring that was thinly studded with long black hair.

The reflexes of the extremities were within normal limits, although the knee jerks were rather prominent. The abdominal reflexes were present.

Beginning with the pelvic region, the muscles of the hips, legs and thighs were normal except for oversize. The ankles and feet were normal. There was an abundant development of fat in the panniculus over the hips, thighs and legs.

The skin was pale, but in addition had a peculiar hue. Many patients who saw these two cases of lipodystrophia at my office have expressed themselves in this statement or its equivalent: "She looks like death." This cadaveric appearance is due to the color of the skin (chloasma), as well as to the advanced fat atrophy. The skin was freely movable over the muscles, had a delicate silklike feel, and when taken between the thumb and forefinger could be lifted for some distance from the muscle. Measurements of the lifted skin from the various parts of the body where fat atrophy existed varied from one half to two and a half inches. The fold of skin lifted over the biceps muscle was two and a quarter inches. The skin of the nonaffected areas was normal except for hypertrichosis. Temperature sense for heat and cold was present and the cutaneous reflexes were practically normal.

Percussion over the chest revealed nothing abnormal, the abdominal regions gave negative results. Auditory percussion was employed to determine the apparent size of the heart, liver, stomach and colon, and disclosed no abnormalities.

This young woman completed the common school course. She found no special difficulty with her studies and her record would indicate that her intellect when a child was above the average. She was extremely alert, analyzed keenly every statement made to her and answered questions with undue precision. She read extensively and was well posted upon current events.

Dysmenorrhea had existed since the age of sixteen years, at which time she first noticed extreme emaciation of the upper part of her body. The pain was more pronounced at each period and lasted from one to two days. Menstruation had been profuse since twenty years of age.

During the winter months she suffered intensely from chilling of the hands and feet, and found it necessary to wear heavy woollen garments over the upper part of her body. It was also necessary for her to wear such a garment when sleeping, otherwise she suffered from aching of the arms and chest.

The urine was examined upon several occasions and gave a specific gravity of approximately 1.020. It also contained a small amount of albumin. The quantity for the twenty-four hours was between thirty-two and forty ounces. Microscopic study revealed nothing of special interest.

The blood pressure was always low—systolic 90 to 110.

Following treatment consisting of two grains of whole gland pituitary substance given three times a day, the patient gained five pounds within a period of two months and menstruation, which had always been accompanied by pain, became normal. Treatment was begun on June 6, 1921, at which time she was given the following capsule:

Cerebrin	gr. 2
Strychnine sulphate	" 1/48
Parathyroid	" 1/20
Pituitary (whole gland)	" 1
Potassium citrate	" 2½

This was taken three times a day for a period of fourteen months, at which time the patient had gained seventeen pounds. The accompanying pictures were taken after she had made the seventeen pound gain, and the picture of the arm does not show the characteristic features present at the beginning of treatment.

Fat has been deposited over the face, chest, arms and the entire upper portion of the body. The second picture shows the enormous size of the legs at the calf region as compared with the arms and conveys an idea of the disproportion of the lower and upper extremities. The calf of the leg now measured sixteen and a half inches and the arm over the biceps seven and a quarter inches. Measurement of the arms and hands have increased from one to one and three quarter inches during treatment, and such increase is entirely due to the deposit of fat beneath the skin. The skin now has a normal tonus. At present the circumference of the body on a level at the trochanter is thirty-six inches, and the crests of the ilia twenty-nine inches, umbilicus level twenty inches. Menstruation is normal. Today this woman enjoys health, is mentally bright and states she can do her work without tiring.

CASE II.—Miss A., aged sixteen years, height five feet, weight eighty-six pounds (normal 112). She was born in Philadelphia. Had completed second year in high school. Enjoyed perfect health during childhood, except for typhoid fever, and was exceptionally adapted to her school work. In August, 1921, her parents noticed that her face and hands were becoming emaciated. On July 4, 1921, she still retained her health and vigor, and was able to take part in a foot race (one hundred yard dash), which she won with ease. At this time her weight was 112 pounds. She had always taken an active part in athletics.

There is no evidence of any hereditary taint, and the patient is the second of eight children, all of whom are healthy. Parents are living and healthy. The patient was first seen at my office February 6, 1922.

There was a heavy growth of light hair covering the scalp and an unusual tendency for it to extend in front of the ears and over the bridge of the nose. Growth of hair on the scalp was so unusual that it was cut close when at the age of thirteen years, but when the patient was seen, the hair reached well down to her hips.

There was also present a growth of fine hair between the shoulders, which extended well up on the neck, and this same feature was present below the elbows over the entire forearms. The arrangement of hair over the pubic region was of the feminine type. The hairy covering over the lower extremities between the knees and ankles was practically the same as that seen on the forearms.

The face displayed an extraordinary degree of emaciation and moderate pallor. The malar bones were prominent, there was an unusual depression in front of the ears, the eyes deeply sunken, and the sclera a pearly white.

There was a well advanced atrophy of fat over the lower portion of the face, and an inverted craterlike depression extending from the lower jaw upwards to the base of the tongue. There were numerous areas of pigmentation (chloasma) over the face. The neck was extremely thin, the muscles standing out prominently, as did also the larynx.

This absence of fat was equally prominent over the shoulders, back and anterior surface of the chest. The mammary glands were of normal size for a female of her age, but hung in a pendulous manner such as one would expect in a woman who had completed a period of lactation. The condition of the abdomen was quite like that seen over the chest and the absence of fat beneath the skin extended as low as the pelvis, where it ended quite abruptly. The arms and hands presented an unilateral absence of fat beneath the skin.

The right arm at the biceps muscle measured seven and a half inches, at the greatest point below the elbow seven and a half inches, and the wrist five and three eighths inches. Measurements of the lower extremities were practically normal for her age and weight of 112 pounds. The ankles measured nine and a quarter inches; greatest portion of the calf region eleven and three quarter inches; legs above the knee twelve and a quarter inches, and the thighs fifteen and a half inches. Expansion of the chest by forced respiration was four and one eighth inches.

The hips were apparently normal from the crest of the ilia to the beginning of the femur bones where there was evidence of a rather pronounced accumulation of fat which involved the thighs, buttocks and to a less marked degree the legs. The lower extremities did not present evidence of fat atrophy at any point, and the ankles did not appear to show any excessive accumulation of fat. An x ray study of of the head disclosed nothing of definite clinical interest.

The skin over the affected areas gave an unusual velvet or silklike feel on palpation, and the absence of fat beneath the skin was immediately apparent, while the skin over the lower extremities had a normal feel. It was possible when the patient flexed her arms, so as to contract the biceps muscle, to see this muscle stand out prominently (Fig. 1); and it gave a peculiar hard sensation to the palpating finger. It was possible to grasp a small portion of the skin and lift it from the arm for a distance of one and a half to two and a half inches. The skin of the arms could be rolled over the muscle—the normal sensation caused by fat beneath the skin was absent. Below the knees the skin was rough. The reflexes were practically normal (the knee jerks may have been slightly increased), and the skin reflexes were not exaggerated. Pupils were large and reacted sluggishly to light and accommodation.

Percussion over both chest and abdomen did not reveal any evidence of disease. Auditory percussion gave the size of the heart and the liver approximately normal. The stomach and colon were likewise normal.

During the past two years in the high school, she had stood second in her class. She displayed an unusual amount of determination which history shows has existed since a child.

Upon all occasions the patient insisted that she felt well. She walked a distance of three miles to school and was never known to complain of exhaustion. She did confess, however, after a few months of treatment, that she slept better and upon awakening she felt refreshed by sleep.

There was amenorrhea after the first evidence of her trouble appeared, and this existed until June 29, 1922 (nearly ten months), at which date menstruation appeared and lasted three days. Since June 29th menstruation has been scanty, but regular. There have been present periodical attacks of abdominal pain, which were more or less closely associated with the menstrual period. No evidence of abdominal disease was detected.

The urine was found to contain a trace of albumin upon several examinations, otherwise normal. Examination of the blood revealed nothing of clinical interest, and the metabolic rate showed but a slight increase which might be regarded as due to excitement.

The treatment was practically the same as that given in the case of Miss X——. In this particular instance it was difficult to get the patient to take enough food, but after a few weeks of treatment the appetite improved and during the summer of 1922 she gained seven pounds. She again returned to school, and since her return in September she gained but one half pound.

CASES FURNISHED BY THE LITERATURE.

In view of the small number of reported cases (fifty-six), and on account of the difficulties attending the examination of such records, an abstract of some of these reports is hereto appended.

Reuben and Zamkin, of the Vanderbilt clinic, New York,' have reported two cases of lipodystrophia progressiva, and gave an able review of the literature. The first was that of a girl aged twelve years. For a period of three years the mother noticed a progressive loss of fat from the body, which began first in the face and progressed as far as the pelvis. The buttocks and lower extremities were not affected. This patient had pertussis at four, measles at five, and scarlatina at six years of age, the latter disease being complicated by cervical lymphadenitis, which required incision. The genitals were somewhat overdeveloped for her age. Röntgenographic examination of the pituitary was negative.

In the second case the patient was a girl aged ten years. Her face was becoming gradually thinner, whereas the lower part of the body was becoming more adipose. Her face looked haggard and had a cadaverous expression. Röntgenographic examination of the skull was negative. Both patients were just as active and as strong as normal individuals of the same age. In this condition, Reuben and Zamkin believe there is an hereditary tendency. These writers reviewed twenty-seven authentic reports.

Louis Leipoldt has met with three cases in children while doing routine school inspection, and his reported cases include three males, aged eleven, fourteen and twenty-four years, respectively.

The case reported by Langmead was that of a female seven and a half years old. This patient died at the age of thirteen and the autopsy was made by Weber and Gunewardene, who published their report in the *British Journal for Diseases of Children,* 1919, p. 200. The microscopic report in this case was given by Dr. H. M. Turnbull, and so far as I have been able to ascertain from the literature, this is the most complete autopsy report in a case of lipodystrophia. F. Parkes Weber was interested in this case and a biopsy report of the skin was made to confirm Langmead's original diagnosis. Among the interesting facts in the report are:

1. There was no evidence of any tuberculosis.
2. The child died following an attack of acute mastoid disease with operation and general pyemia.
3. There were present acute nephritis, large septic liver and spleen. These acute pathological evidences were regarded as the result of the acute ear condition.
4. Disappearance of fat from the panniculus was observed over all affected areas.
5. A moderate amount of fat was present at the gluteal regions, orbits, omentum, about the kidneys, heart, pericardium, and under the serous membranes.
6. The thyroid gland was rather large, and microscopic examination showed it to be rich in colloid material. The thymus gland was represented by a scanty remnant. The brain did not display any

evidence of disease. The ovaries, pituitary gland, and suprarenals showed nothing abnormal microscopically.

7. Microscopic examination of the sections and a special report by Dr. Turnbull follows: The sections included a depth of the scalp which under normal condition contains subcutaneous fat, but these did not show such fat. External to the hair follicles in the deeper part of the sections there were a few small areas which might have contained small fat cells and apart from these doubtful areas there was no evidence of fat tissue. The interstitial scalp was denser than normal.

At autopsy it was noticed that the thyroid gland was large and apparently rich in colloid material. The sections studied completed a transsection of a lateral lobe. There was an unusual amount of colloid in the acini throughout the section.

The excess of colloid was associated in some acini with a slight desquamation of proliferated epithelial cells.' The condition of the acini suggested that the gland was in a state of moderate colloidal overactivity. At the same time, as far as can be judged without a special stain, the interstitial tissue was more abundant and denser than in control specimens showing colloidal hypertrophy in children of the same age, and more abundant and denser than in the normal thyroid.

The appearance of the whole section suggested that a moderate degree of oversecretion of colloid was associated with a slight fibrosis and actual diminution in size of the gland.

The cortical cells were small, their cytoplasm stained deeply and displayed vesiculation. Turnbull concludes that the zona glomerulosa and zona fasciculata contained less lipoid than normal for a child thirteen years of age. Retroperitoneal tissue included showed the presence of fat. The ovary revealed nothing abnormal.

The section had been made transversely through the anterior lobe, a small part of the stalk being included. Since the routine procedure was to make a sagittal section through the centre of the gland, he was unable to make use of controls. Further, the method of staining had not differentiated clearly the chromophobe cells from the chromophile, and the cyanophil cells from the eosinophile.

There was an absence of fat from the scalp. Scattering fat cells were detected in one section of the suprarenals. Retroperitoneal tissue contained the normal amount of fat. In none of the sections were there found lobules of embryonic fatty tissue, such as were commonly seen in infants under two years of age. It was to be regretted that the study of the pituitary body could not have been conducted in the manner ordinarily employed by the examiner. Suprarenal lipoid was diminished in the cortical tissue. The presence of an excess of colloid in the thyroid tissues far exceeded that present in females at puberty. No fat was found in the skin or in the panniculus of the arms, scalp and chest. Turnbull suggested that the condition present was pathological and not a phase of normal activity. Further study was necessary to determine the relationship between thyroid changes and fat dystrophy.

Husler reported the first autopsy on the body of a boy aged fourteen, who died during an attack of cerebrospinal meningitis. In this case the fat atrophy was limited to the face; the genitalia were found to be infantile, and there was a persistent thymus. The suprarenals presented a whitish medullary substance, and the cortex of these organs was rich in fat and pigment.

Zella, in his excellent review of the literature on lipodystrophia progressiva, published in 1919, was able to find thirty-six authentic case reports of this condition.

Langmead has reported the case of a female aged seven and a half years.

G. Janson's case was a female of six years, and showed typical emaciation of the face and neck, which did not extend below the umbilicus. The skin was dry and the lymph nodes prominent. This case was not included by Reuben and Zamkin.

Bossert and Rollett's patient was a girl aged eleven years. She began to grow thin in the face, arms, chest and abdomen when four years old, following a severe fright. Lower extremities remained normal and there was abundant fat on the buttocks.

Henry L. Smith, of Baltimore, has contributed the case of a female aged thirty years. Smith cites moderate enlargement of the thyroid, some prominence of the eyes, tachycardia, tremor and hypertension in connection with his case. Mention is further made of a case that was under the care of L. F. Barker and T. P. Sprunt, where increased metabolic rate, hypersensitiveness to adrenalin, and some of the ocular phenomena of thyroid disease, tachycardia, and thyroid struma, were present.

W. G. MacCallum, in a report on the microscopic findings of the skin in the case of H. L. Smith, gives the following: "The epidermis appears to be normal. The epithelial cells are in a uniform layer with normal papillæ of the corium and the normal arrangement of hair follicles. In one section there was a minute area in which the epithelium was somewhat pigmented, and in the interpapillary areas there were groups of pigmented cells. Elsewhere the corium shows no accumulations of cells, except in one or two papillary projections which are infiltrated with mononuclear cells. Most of these are small lymphoid cells, with no granules, but there are a few scattered eosinophile mononuclear cells. Everywhere through the corium, in much greater numbers than in the normal specimens used for comparison, there are twisting and writhing elongated cells which appear to be wandering in the crevices of the connective tissue, especially about the bloodvessels and sweat glands, but also about the sebaceous glands. These have a relatively small nucleus, and an elongated cell body full of basophile granules (mast cells). The corium itself is not abnormal; the elastic tissue fibrils run in alternate directions in successive layers and are well developed. The hair follicles are normal in all respects and the sebaceous glands are quite normal. They contain much doubly refractive fat in large and small globules, which shines with a marblelike lustre under the polarizing microscope. It stains black with osmic acid and red with sudan. Some of it is stained adhering to the hairs as they lie in the root sheaths. The sweat glands are abundant and normal. The tissue just below the corium is extremely loose and is composed of fine, wavy, connective tissue fibrils by no means so coarse as those of the corium, and a few delicate elastic fibrils. There are, as in the corium, bloodvessels and some small nerves which appear to be normal. The deeper layers of this tissue contain more vessels of larger size, of which the arteries show a distinct elastic lamella. The veins show no obvious elasticity, but their endothelium appears to be rather swollen and extremely transparent. No fat is found in the upper layers of this tissue, and it is only in its deepest layers that one encounters several small groups of three or four fat cells which are distended with fat globules. This stains brilliantly with osmic acid or sudan . . . It is not possible to distinguish which of the other cells about these and supplied by the same small bloodvessels are really fat cells, since none of them have any very characteristic form and none contain oil droplets. The fascia does not seem to be abnormal."

CONCLUSIONS.

1. The two patients furnishing the basis for this report have both shown considerable improvement as the result of treatment.
2. In the presentation of this paper it is hoped that the profession at large may be made better acquainted with lipodystrophia.
3. Menstrual abnormalities were present in both cases.
4. Brief notes on typical cases furnished by the literature have been appended.
5. It was impossible to connect clinically my two cases with abnormal functions of the endocrines. There was present, however, some ovarian dysfunction in each case.
6. Abnormality of the skin, including fat atrophy, softness of the skin and roughness of the skin, as well as hypertrichosis, were important factors in the diagnosis.
7. A microscopic study of sections of the skin taken from the affected areas, reveals positive diagnostic evidences.
8. In cases that have gone to autopsy, the thyroid showed an abundance of colloid and mild fibrosis. The suprarenals were deficient in fat in both the zona folliculosa and zona glomerulosa. Husler's case showed a whitish medullary substance and the cortex was rich in fat and pigment. The panniculus and skin were without fat where it normally existed. The thymus was normal in one case and persistent in the other. In males the testes were infantile.

The author's references will appear in his reprints.

Erythema Nodosum Associated with Streptococcic Faucitis

By W. RIDGELY STONE, M.D.,
New York.

The wide prevalence of streptococcic throats during this past spring and late winter in New York and its environs is well known to the profession and easily recognizable. It is interesting to remark the number of these cases which are not associated with involvement of the tonsils, but seem rather to take the type of faucitis, involving the postnasal pharynx and the mucous membranes of the nose, extending even into the Eustachian tubes. The varying severity of these throats has been from a mild faucitis to involvements of the various nerve trunks, and even joint tissues, throughout the body. Just how the toxins or organisms enter the circulation and are transferred to various portions of the body is not to be dwelt upon here, but the two following cases seem definitely to show an association with what was formerly called a rheumatic condition, to wit: erythema nodosum. Erythema nodosum has long since been recognized as a complication or sequela to rheumatic fever. The establishment of the bacterial origin of rheumatism seems to presuppose that all forms of erythema nodosum are due to some bacterial cause. The two cases cited below would seem to bear out most conclusively a bacterial causation in this rather unusual complication of infections. In Case I there is also present a predisposition both hereditary and acquired to tuberculous tendencies, but in this case the outbreak of the erythema nodosum is definitely associated with a streptococcic infection of the mucous membrane of the throat and nose. About two years ago a patient was attacked by a definite rheumatic infection accompanied by an erythema nodosum.

CASE I.—M. F., aged forty-two, consulted me on March 1st because of intense sore throat and rhinitis. The attack was ushered in by usual febrile symptoms and her temperature on the date which I saw her was 102°. Three days later she came to my office with a typical erythema nodosum involving the extensor surfaces of the forearms and legs. This was accompanied by the usual symptoms. She was put on salicylates and alkalines and by May 11th her symptoms had practically disappeared.

CASE II.—E. M. C., male, aged forty-two, came to me on April 27th with a typical streptococcic involvement of the throat and nose, accompanied by a mild inflammatory involvement of the middle ear which was nonsuppurative. That night he was taken with chills and his temperature went to 103.5°. He was confined to his bed for forty-eight hours, at the end of which time he broke out into a profuse sweat and became distinctly better. On the following day pains developed in his ankles and left foot, and he complained of pain in the left calf. On May 1st there were distinct nodules on both legs and forearms. On May 10th there developed a typical bunch of clusters of shingles over the calf of the left leg which was the area where he had previously suffered pain. The eruption was accompanied by pain and burning, but no itching. He was given aspirin and alkalies, and on May 16th was practically ffree from pain throughout the body and, with the exception of general systemic weakness, appeared once more to be normal.

This case exhibits an interesting feature of the association of erythema nodosum and herpes zoster. For a long time it has been my belief that all forms of neuritis have their origin in either trauma or a bacteriemia of some variety. This would seem to be borne out in this case as the focal infection no doubt lay in his streptococcic faucitis.

CONCLUSION.

It would seem more than likely that streptococcic infection of the throat is capable of producing an erythema nodosum; secondly, in Case II, the association of herpes zoster and erythema nodosum gives added proof that both are possibly of bacteriemic origin.

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Epithelioma of the Back of the Hand

By DOUGLASS W. MONTGOMERY, M.D.,
and GEORGE D. CULVER, M.D.,
San Francisco, Cal.

Epitheliomata vary in their origin, appearance, and course in each region of the body. From the nature of these growths this is only natural, as they are not adventitious tumors in any sense, but spring from the epithelium of the affected region, and, therefore, partake of the nature of the epithelium in that region.

Most of the epitheliomata of the free cutaneous surface arise from rough patches called seborrheic or senile patches, and most of these patches, with their consequent epitheliomata, occur on the face and the back of hands—situations exposed to light and to the inclemencies of the weather, which undoubtedly influence their occurrence.

The seborrheic keratoses on the back of the hand tend to be much more rocky, more tightly adherent and by far more stubborn to treatment than those on the face. As a compensation, however, it is much rarer for them to degenerate into epitheliomata. When they do so evolve they most frequently form a broad, flattened papule, which grows broader and thicker, and finally the centre degenerates into a granulating, crusted ulcer. Not until comparatively late in its course, however, does it extend downward into the underlying tissues. When it does so extend, the situation becomes very grave indeed, as surgical or cauterant procedures for the elimination of the growth are then almost certain to implicate the underlying tendons and tendon sheaths. It is for this reason that treatment by the electromagnetic energy of radium or x rays is so desirable.

Case I.—A few weeks ago a man, sixty-five years of age, called on us for a condition illustrating well the occurrence of senile patches with a beginning epithelioma. The patches were very hard and tightly adherent, and it was necessary to soak them thoroughly with liquor potassæ before removal with a curette. On the back of the left hand there had slowly developed a circular, red, raised, domeshaped growth one centimetre in diameter. In the middle of its upper surface a vesicle had formed, where undoubtedly ultimately an ulcer would develop. This vesicle probably was due to a streptococcic infection occurring on tissue of low resistance.

The normal history of this growth would be a continuous, slow, centrifugal enlargement with a rounded, advancing border, and some increase in thickness in the pancakelike tumor. As it increased in thickness it would slowly penetrate into the deeper tissues, and would ulcerate on its upper surface. As the tumor in this man's case was in its incipiency it was easily controllable with radium. The radium, by its reaction, caused an exfoliation of the epithelial covering, and then the essential tumor formation was found to be much larger than at first anticipated.

The following four cases are all in the same class as having spread peripherally from a small beginning into large, flattened, ulcerating, tomatolike tumors.

Case II.—A man, aged eighty-four, consulted us on February 5, 1917, for a large epithelioma on the back of the hand which, both on account of its extent and the age of the patient, was inoperable. There was, however, no glandular involvement.

We at first employed radium unscreened as we knew that the thickness of the pathological tissue formed a sufficient screen in itself. Afterwards we screened heavily, thus employing the gamma rays alone, and we combined them with x rays. The growth was slowly receding, and eventually might have cleared up, but the patient died from old age in August, 1917, five months after commencing treatment. This is the subject of epithelioma on the back of the hand shown in Fig. 1.

Case III.—A man, eighty-seven years of age, applied for treatment in June, 1913, for a large epithelioma occupying nearly the whole back of the right hand. The lesion was immovable on its base, the action of the extensor tendons was interfered with, and the fingers were sausageshaped from edema. Although the affection had been present a long time there was no glandular involvement.

An operation, which would have necessitated the removal of the hand, was out of the question on account of the patient's age and general condition. An energetic treatment with x rays had no appreciable effect on the lesion. Radium was not then available. Shortly afterwards the patient died of old age.

The refractoriness to treatment in this case seemed to be due to the thickness of the growth, which acted as an effectual screen against the destructive influence of the wavelets of electromagnetic energy on the advancing base of epithelial infiltration, and we were deterred by the patient's debility and by the proximity of the tendon sheaths from employing ablation or caustics to reduce this thickness.

CASE IV.—A man, sixty-two years of age, consulted us on February 28, 1919, on account of an epithelioma on the back of the left hand four by six centimetres in size. The tendons were freely movable beneath it. After a vigorous irradiation it had decreased to two and a half by five centimetres in eighteen days. It continued to decrease steadily, but more slowly, both in area and in thickness. The end of April he returned to his home in the country, and we did not see him again till the middle of September, when there was still a small residuum of his trouble, for which we gave two vigorous irradiations. Subsequent to this we heard that the cancer had disappeared.

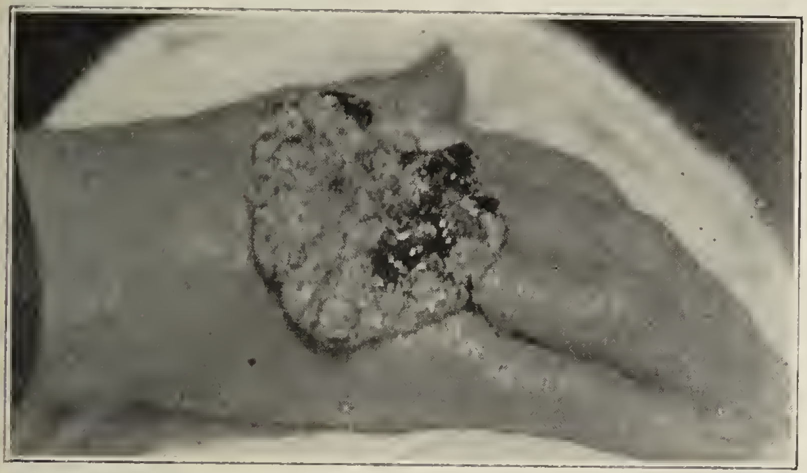

FIG. 1.—Case II. A far advanced fungating tumor with a necessarily grave prognosis. Although it had existed a long time and was very large, there was no glandular involvement.

The two following cases, in addition to being of the large, granulating type, like the two foregoing, are interesting as appearing shortly after an injury.

CASE V.—A man, sixty years of age, consulted us in September, 1917, on account of an epithelioma on the back of the right hand. He said he had been injured there the preceding May, and that the wound had healed in about six weeks. About the first of August the present lesion began to grow, and was now about two and a half centimetres in diameter. The tendons were not involved.

By November, after a thorough irradiation with radium, the epithelioma began to close in gradually, but the centre was still covered by a thick, tightly adherent, yellow coating, and by the end of November there was still a very small unhealed area. We then lost sight of him. In August, 1920, three years after first seeing him, the patient called again for a small wound on the back of the same hand, about which he was anxious on account of his previous experience. This wound healed without incident, and the scar at the site of the epithelioma was now seen to be perfect, with no signs of recurrence.

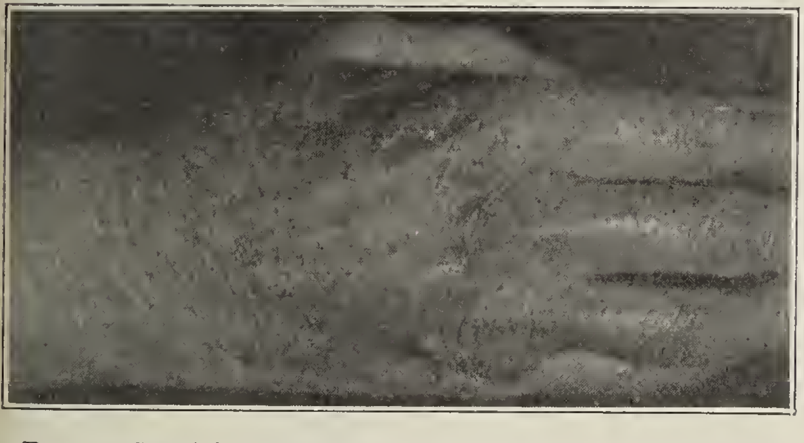

FIG. 3.—Case VI. Shows the small, flat, smooth, pliable scar left after the recession of the tumor shown in Fig. 2.

Cases have been observed of epithelioma following close upon traumatism. For instance, Howard Fox has reported one resembling a granuloma pyogenicum, a lesion which frequently is preceded by a wound, and it is well, therefore, always to think of the clincial resemblance of these two diseases. Hartzell also has mentioned a case in which an epithelioma followed close upon the receipt of an injury.

CASE VI.—A woman, aged seventy, called on June 16, 1922, with a lesion on the back of the right hand, most interesting both as beginning shortly after a traumatism, and also on account of its rapid growth. Curiously enough, about six years previously she had had a growth of some kind on the back of the same hand, which had been excised, and the scar of which was still plainly visible. No pathological connection, however, could be traced between the previous growth and the one under observation.

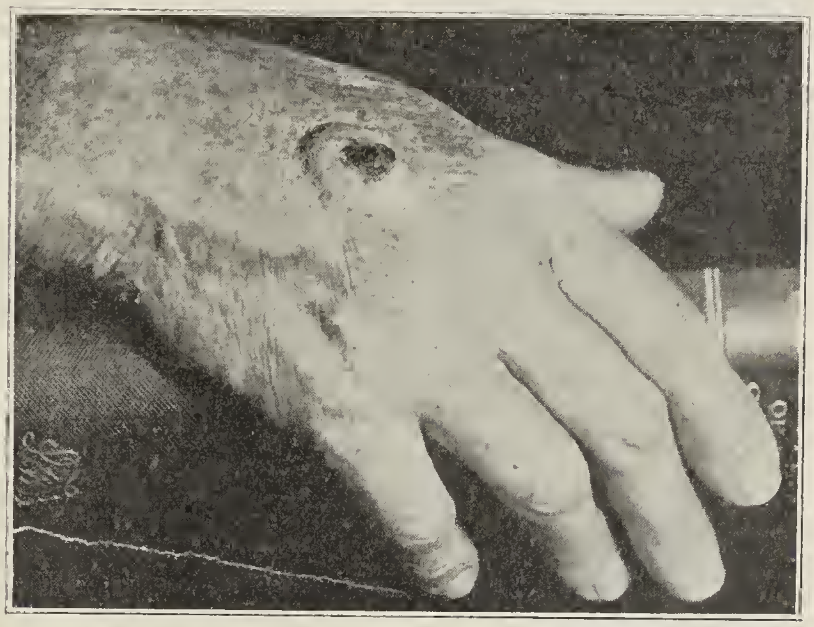

FIG. 2.—Case VI. The most interesting case of the group. This tumor would eventually have developed into a condition similar to that shown in Fig. 1.

The patient said that on Easter Sunday, that is, two months previously, she had skinned the back of her hand by running it against a shelf. The skin was flapped back in a triangular shape, and the wound must have been quite deep, as it was closed by taking several stitches. She said that it had healed with remarkable rapidity.

In about two weeks a lump appeared at the very tip of the triangle, which had grown into the present large tumor. It was a prominent, circular, firm, granulating mass with rounded edges and a flat top, and in the very centre a black crust. It was two and a half centimetres in diameter. It, fortunately, was perfectly movable on its base, showing that it had not infiltrated down between the tendons. It is the subject of Figs. 2 and 3.

Because of its granular appearance, its originating in a wound, and its rapid growth, it had to be differentiated from granuloma pyogenicum, which was perfectly easy in this case. We thought by vigorous irradiation that we might be able to annihilate it, but we were not oversanguine in this, and told her attending physician that a restriction in size down to easily operable proportions might be the best attainable result. We irradiated it by placing thirty-six milligrams of radium directly over the tumor, and also by crossfire by placing sixty-six milligrams of radium in the palm. We gave it exposures amounting to twenty-four hours. Although the radium in the palm was heavily screened a large blister formed. Gradually the growth receded, and in four months the lesion was completely healed, leaving a circular, slightly depressed scar, as shown in Fig. 3.

We consider this one of our best results, the alternative in such a rapidly growing tumor in this situation being amputation of the hand.

The epitheliomata here reported are all of the prominent, broad, flattened variety, differing decidedly from those usually seen on the face. Their consistence is firm, due to the tightly packed infiltrating epithelial cells with very little connective tissue framework, of which they essentially consist. They bleed easily because the bloodvessels and the connective tissue strands in which the bloodvessels run are so delicate. The molecular necrosis and ulceration of the substructures is, however, late. In none of the cases, though some were of long standing, was there any glandular involvement. In two of the cases the growth followed a traumatism; in one of these so closely as to be designated a direct sequence.

The susceptibility to the influence of the rays of electromagnetic energy, whether produced from a Crookes tube or from radium, was not nearly so prompt as is usually met with in epitheliomata of the face. This contrast was especially great as against the epitheliomata of the eyelids, which react particularly favorably to this treatment.

323 Geary Street.

Plastic Surgery of the Face and Neck*

By J. EASTMAN SHEEHAN, M.D., F.A.C.S.,
New York.

Plastic surgery is an increasingly widening expression. It may be described as constructive surgery, in contradistinction to destructive surgery. Plastic operations restore and repair ravages caused by accident, disease, old age, and congenital disfigurements, and the methods of treatment may also be used for cosmetic purposes. It is not my intention to describe *in extenso* any of the many plastic procedures, but I shall bring to your attention the rapid and marvelous strides this branch of surgery has made within a short period of time. I am sure you will agree with me that no other branch of surgical work has made such progress within recent years as has plastic surgery.

It was my good fortune to be associated for several years with Major Gillies, at Sidcup, England, where this branch of surgery, under his direction, has been highly developed with extraordinary success.

The war afforded the surgeon undreamed of opportunities for plastic operations. Those surgeons whose names were well known to all of us before the war, and who performed reconstructive operations, suddenly found that their well known methods were of limited value in meeting the avalanche of unusual disfigurements of face and neck. In order to accomplish the plastic repair of these *mutilées,* newer methods were evolved and the older ones either discarded or improved. Thus at Sidcup, as a result of the methods successfully applied in the treatment of large numbers of cases, there was developed a School of Plastic Surgery, which quite surpassed in technic the methods and treatment (admirable though they were) of any institution to be found in any of the other allied or belligerent nations. The brilliant successes at this hospital were made possible principally by the introduction of the tube pedicle flap of Gillies, and in the use of the Thiersch graft introduced by Esser of Holland, and modified and improved upon by Pickerill, Gillies and Waldron, whereby ephithelium could be supplied to cavities, sulci and exposed raw surfaces. These methods undoubtedly constitute a permanent contribution to plastic surgery.

I shall not attempt to describe to you the technic of making a tube pedicle, for I am quite sure it is now familiar to all of you. Much has been written about it, but I should like to impress upon you the fact that our experience has taught us that the pedicle should not exceed eight inches in the male and six inches in the female and in children. It is essential that the original blood lymph and nerve supply of the pedicle flaps should be maintained through the pedicles. The pedicles are so formed that the bloodvessels running into the transplant remain uncut until after the pedicle has fully served its purpose.

The next feature of the plastic surgeon's work to which I would draw your attention is the method known as rhinoplasty, i.e., the formation of a new nose out of tissue derived from another part, in place of one destroyed by the ravages of disease. While the total loss of the nose from accidental causes resulting from civil occupations is not usual, such loss from disease is not uncommon, and is, therefore, a condition which the special surgeon may be called upon to remedy in the course of his ordinary practice. It is essential in performing a rhinoplasty that an adequate lining, a proper support to the bridge and a covering be supplied. The reconstruction should conform to carefully modelled patterns.

The recent rapid progress in our knowledge of the bone graft, as a means of repair for fractured

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*Delivered at the annual meeting of the Medical Society of the State of New York, October 21, 1922.

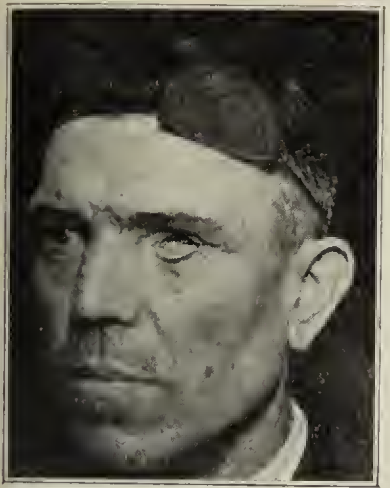

Fig. 1.—Ectropion of lower lid with marked scarring of the conjunctival cul de sac.

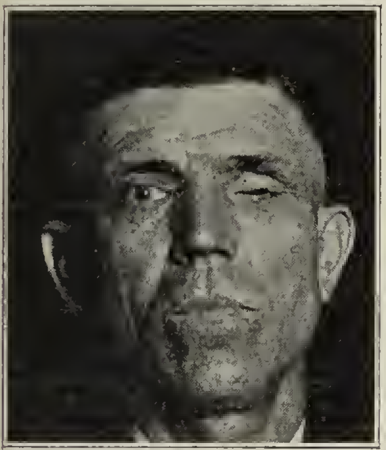

Fig. 2.—Repair of ectropion.

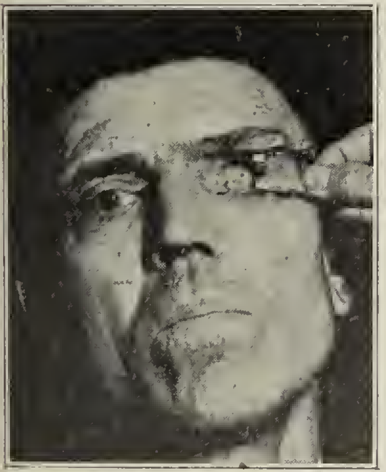

Fig. 3.—Complete epithelization of the conjunctival cul de sac.

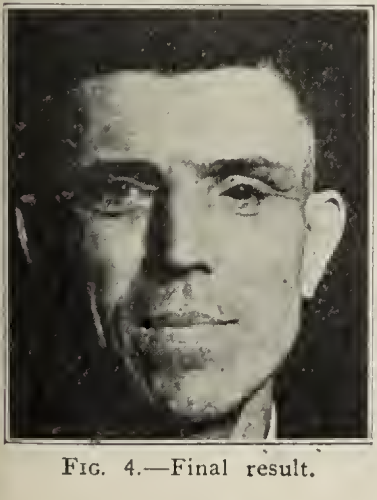

Fig. 4.—Final result.

jaw, has been mainly due to the efforts of such men as Albee, of America, and Gilbert Chubb and Percy Cole, of England, whose experience covers a large number of such cases. The graft is taken preferably from the ilium. This source has several advantages. The size of the graft is practically unlimited. All sclerosed and uncertain bone can therefore be freely removed from the jaw fragments. The soft and vascular nature of the iliac crest facilitates the manipulation of the graft and its subsequent union and consolidation. By varying the position of the iliac crest it is possible to obtain a graft of a general curvature suitable to each particular case. There is little, if any, postoperative disability.

In the treatment of burns plastic surgery finds one of its widest fields of usefulness. Motor accidents, factory and other explosions bring into our hospitals many distressing disfigurements which can now be successfully treated by the latest improvements in skin grafting. I do not mean by this that perfection has been attained in the treatment and successful repair of these cases, for the deformities and disabilities resulting from contractures following severe burns still present a puzzling problem. By fair and constructive criticism and development of present methods, others in this field will undoubtedly advance the plastic treatment of these deformities to a stage where complete success will be the usual result. Even now it is quite possible to graft new eyelids and eyebrows to replace those which have been burned.

With men, in the reconstruction of the upper lip the disfigurement may be covered with hairy tissue obtained from the scalp or similar tissue taken from the nearby regions. With women, the problem is a more difficult one, as many times it is necessary to use a combination of several methods, such as the French, the tube pedicle flap, and the Thiersch graft. Colored spots in the newly formed lip resulting from the transposition of tissue may be rendered white by the application of sulphate of zinc.

Plastic surgery includes within its sphere cosmetic betterment and the treatment of conditions traceable to traumatic, pathological and congenital causes. It has a proper place also in the cure of disease, for example, the epithelization of mastoid and nasal sinus cavities and epipharyngeal contractures as a result of syphilis. Moreover it may be applied to the preservation of function, as in the epithelization of the tonsil sulci. Although it may not be quite in order to make the suggestion, nevertheless I desire to record my belief that the cure for endocervicitis, if its etiology is of a local nature, lies in the epithelization of the parts.

A word about socalled cosmetic surgery as so frequently practised by those who call themselves beauty specialists. The practices of these disgraces to our profession, though apparently successful at first, seldom result in permanent improvement but rather in increased disfigurement, and the consequence of the methods employed by them, for instance, the injection of paraffin is frequently manifest in a general impairment of the health of the patient.

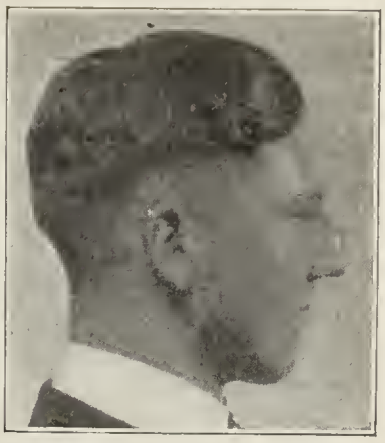

Fig. 5.—Hump nose before operation.

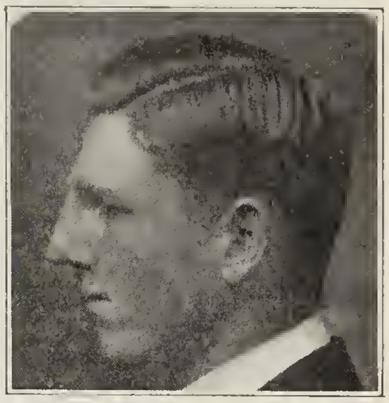

Fig. 6. — Hump removed through columella incision.

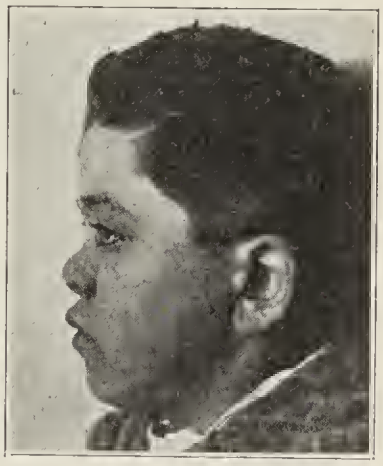

Fig. 7.—Traumatic saddle nose.

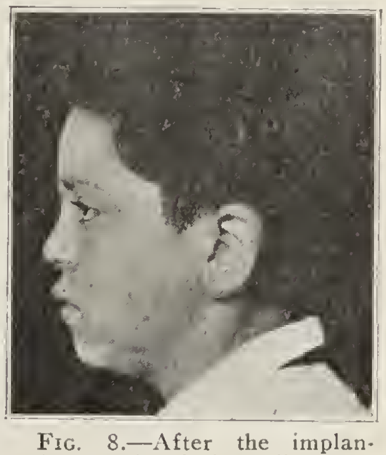

Fig. 8.—After the implantation of chondral cartilage.

The time is not far distant when hospitals must create departments of plastic surgery, placing it upon a sound footing as a separate and distinct branch of surgical work. Postgraduate schools must provide the facilities for men eager to learn the principles of this branch of surgery. Plastic surgery is not easy to master. It requires a thorough operative knowledge, imagination, patience, tenacity of purpose, courage, originality, the feeling of an artist and deftness of hand.

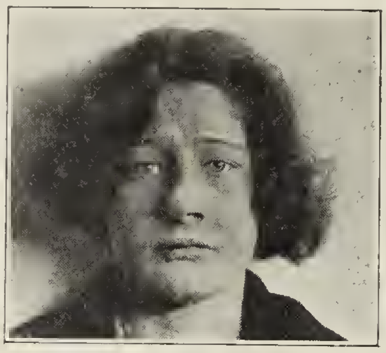

Fig. 9.

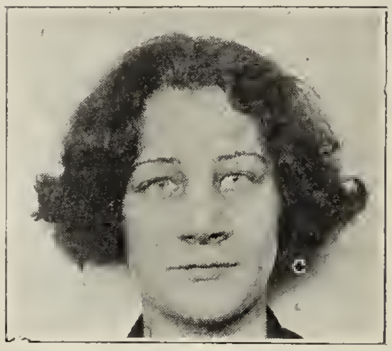

Fig. 10.

Fig. 9.—Deflected nose.

Fig. 10.—Final result. Correction of the external deflection of the nose and the removal of the nasal septum through the columella incision of Sheehan. (One sitting.)

The plastic surgeon must frequently consult, for the attainment of his best results, the dentist, the sculptor and the artist, for reconstruction should be planned on true, feasible and artistic lines. Not only must the injured member, nose, jaw or lip, be restored, but the restoration must harmonize with the patient's facial characteristics and conformation. A cast and photograph of the patient is carefully examined and compared with previous photographs, and the advice of the sculptor or artist is obtained before the restoration or repair is attempted.

In a sense, the sacrifices of the men who fought in the late war are placing upon humanity an additional obligation, for the experiences secured in treating the mutilations and ravages of that conflict are establishing for the benefit of others the methods by which may be successfully treated those disfigurements which heretofore have ruined the lives of men and women, who, conscious of their repulsive appearance, have avoided the company of and shunned contact with even those who were dearest to them, have discouragingly abandoned the attempt to realize their ambitions, and in consequence become morose and misanthropical. A wonderful change is accomplished when the disfigurement or defect is remedied. He, who was the object of his own contempt and the loathing of others, recovers his selfrespect and finds that his importance in the eyes of others has returned. Opportunities for contracting desirable alliances, both business and matrimonial, are restored. In short, what was a pitiable spectacle is changed into a normal member of society, deterred neither by his own consciousness nor the repugnance of others from becoming a desirable member of the community in which he resides, nor from assuming all the obligations of husband or wife, father or mother, or citizen having a part to play in the accomplishment of the destinies of the State.

A glance at the photographs will show that after the successful restoration of the patient he assumes a more cheerful countenance and is better dressed and groomed. It is apparent that he desires to look well, being undoubtedly stimulated in this desire by the contrast between his present condition and his previous terrible state of hopelessness. His aspect of life has changed for the better and the operator himself is thrilled by the results obtained through this merciful branch of surgery.

24 East Forty-eighth Street.

Skin Diseases and Metabolic Disorders*

By OSCAR L. LEVIN, M.D.,

New York,

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The skin is an important organ of the body, performing certain functions, some of which are essential to life. An intimate relationship exists between these functions and those of the other organs of the body. A general disturbance may result in diseases of the skin, or a skin affection may be the starting point of internal disorders; or both the skin and internal organs may be simultaneously affected by endogenous and exogenous factors, such as bacteria, toxins, drugs, chemicals, and physical agents. It is, therefore, readily seen how difficult it is to state positively whether the skin condition is the result of internal disease, or the causative factor producing a general disturbance.

Metabolism signifies the chemical changes which substances undergo when brought into contact with the living cells of the body. Two factors are involved: catabolism, or reduction of higher to lower compounds, and anabolism, the building of complex substances from simpler ones. As a result of these chemical changes life is sustained.

New and improved methods of investigation are enlightening our conceptions of disease; great advance is being made in our knowledge of the pathological metabolism of the general body economy. Our literature on the subject of metabolism in dermatology, although much increased of late, is, however, by no means complete. The conclusions reached by different workers are not in entire accord. Improvement in the methods of technic in biochemistry, microscopy, functional tests, serology, and other laboratory studies, as well as close and intelligent clinical observation and interpretation, will confirm or disprove our present views, most of which are tentative. Knowledge of this nature

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*Read at the October, 1922, meeting of the Eastern Medical Society.

gives one a clearer outlook on the etiology and treatment of the different dermatoses.

In this paper I shall not consider the cutaneous diseases or lesions which are recognized as external expressions of infectious, constitutional diseases, such as the exanthemata, typhoid, typhus, syphilis and tuberculosis. Neither shall I discuss parasitic skin diseases like scabies, pediculosis and ringworm, nor infections like impetigo and ecthyma. Even in the groups mentioned above there seems to be some metabolic condition which predisposes the integument to the development of the type of lesion. I shall also omit drug eruptions, although there seems to be some relation of the general economy to the skin which predisposes it to the eruptions. Some have ascribed this to an idiosyncrasy, others to anaphylaxis, but sufficient knowledge is not available to explain this susceptibility.

This exclusion leaves only dermatoses which occur with disorders of metabolism such as diabetes and rheumatism; dermatoses in which metabolic disorders are often found, such as acne vulgaris and seborrhea, and finally, dermatoses such as erythema multiforme and leukamids in which toxic products of metabolic disorders seem to be causal. In all these conditions the skin is apparently attacked by the products of the faulty metabolism by way of the vascular, nervous and glandular systems acting upon the nutrition, the innervation, the secretion and physiological growth and repair of the skin.

Acne vulgaris appears about the time of puberty and persists through that period of life during which the gonadal functions are coördinated with the other metabolic activities of the body. Other evidences of an endocrinal relationship are the recurrence of pustules, especially on the chin, during or about the time of the menstrual period, the increased severity and number of lesions about the same time, and the frequent association of hyperthyroidism with acne vulgaris. Menstrual complaints and uterine disorders are often found to accompany the condition. Montgomery and Culver cited disturbances of metabolism found in goitre as causative. In our series of twenty-two cases in which the basal metabolic rate was determined we found a slight increase in twenty.

The eruption is always aggravated by constipation and a diet rich in carbohydrates. Schwartz, Heiman and Mahnken reported hyperglycemia in acne vulgaris, Levin and Kahn showed that hyperglycemia or a high normal blood sugar accompanied over fifty per cent. of their cases. The blood sugar curve was normal in all the twenty-three patients who were studied for their carbohydrate tolerance; but the renal glucose threshold was lowered in four, and the feces from nineteen showed carbohydrate fermentation.

In 1919 Schwartz, Levin and Mahnken found a mild or moderate state of acidosis in acne vulgaris. Sweitzer and Michelson, in 1920, found no marked or consistent change in the alkali reserve in this condition. Since then we have continued our investigations in collaboration with Kahn and have found a mild form of acidosis in about one third of the cases.

It is recommended that local x ray therapy should be accompanied by a diet low in carbohydrates, anticostive and general tonic measures, alkalies and extracts of internal secretions when indicated.

Rosacea is most common in women at puberty, during the menstrual flow, during pregnancy, and in those with uteroovarian disease. It is always worse in individuals who suffer from gastric hyperacidity and constipation, and who use hot, irritating and stimulating foods and beverages immoderately. Johnston reported the association of gastrointestinal derangements, particulaarly hyperacidity and intestinal fermentation, in rosacea. He also showed the presence of hyperacidity in premature alopecia and in a peculiar form of acneiform dermatitis. This differs from acne vulgaris in that it appears ten to twenty years after puberty and is seated about milia rather than comedones, and from rosacea in its occurrence chiefly on the forehead and line of the jaws and in the absence of telangiectasis.

Darier has applied the term keratosis to a condition of the skin which most of us recognize as seborrhoea. For its etiology he regards direct heredity, or the influence of poor health or bad hygiene of the parents, as constituting the fundamental conditions. The establishment of the genital functions and sexual disturbances on the one hand, unhygienic diet on the other, in the form of hypernitrogenous diet, abuse of stimulants, coarse food, insufficient mastication, abnormal fermentation and constipation are common factors. This condition predisposes to seborrheic eczema, acne vulgaris, rosacea, premature gray hair, and in the aged to seborrheal warts and senile keratoses.

Barber and Semon remark that seborrheic individuals are characterized by an acidosis, as is evidenced by the hyperacidity of the urine and the reaction to treatment by alkalies. Schwartz, Levin and Mahnken detected a lowered alkali reserve of the blood in seborrheic eczema. Levin and Kahn corroborated the presence of acidosis in seborrheic eczema.

All disorders which reduce the general vitality predispose the skin to eczema. Blondes with their dry and thin skins show eczema more frequently than brunettes. The dry skin of diabetes mellitus and insipidus also predisposes to the condition. Towle, Talbot and C. J. White found in acute infantile eczema that the stools showed indigestion of the fats and sugars. Czerny considered infantile eczema evidence of an exudative diathesis occurring in overfed infants, with fat intolerance. Numerous writers cite the frequent complication of eczema in gout and rheumatism. White states that, in the great majority of patients with chronic eczema, anaphylactic phenomena to one or more foods may be found. Johnston was of the opinion that the causation of eczema was due to a derangement of the nitrogen metabolism, and possibly due to protein splitting in the blood stream before the tissues selected their store of amino acid nitrogen.

In our investigations in eczema we found that in mild cases there were no disturbances in the chemical composition of the blood nor in the condition of the hydrogen ion concentration of the body fluids. In eczema accompanied by other metabolic derangements the deviation of the blood chemistry was due to the metabolic diseases. In the latter cases conditions of acidosis were noticed. In severe diffuse eczema we observed a state of acidosis, an increased ethereal sulphate fraction in the urine, indicative, perhaps, of intestinal putrefaction, but otherwise a normal blood chemistry. A certain number of breast and artificially fed infants show eczema as a result of food anaphylaxis. Removal of the offending food from the mother's or infant's diet often clears up the inflammation.

Among the various factors which have been mentioned as causative in psoriasis are gout, rheumatism and renal disease. Schamberg is of the opinion that psoriatic patients retain nitrogen. Johnston and Schwartz found no recognizable disturbances in the nitrogen metabolism in cases of psoriasis. In collaboration with Kahn I observed no change in the blood chemistry so far as the nitrogen disturbance was concerned. A number of the patients showed a mild state of acidosis. A remarkable increase was noted in the nonprotein sulphur of the blood. The administration of a diet low in proteins is rarely of therapeutic value. Thyroid is at times of benefit in the treatment of psoriasis.

Among the many causes mentioned in the etiology of the erythemas are toxemias, rheumatism and visceral disorders. In some of our cases we have detected abnormal figures in the chemistry of the blood, but these were explainable by the general condition present. Some of the cases are anaphylactic in nature.

Urticaria is frequently an anaphylactic phenomenon. Other factors, like constipation and proteid sensitization, may be causal. Toxemias from metabolic disorder in general diseases like Hodgkin's disease and leucemia may express themselves externally in the form of wheals, urticarial papules, and prurigo. Dysfunction of glands of internal secretion, the thyroid, and especially the adrenals, predispose to the condition. Poor sympathicotonus may be detected in almost every case of urticaria. In prurigo of children, which is regarded as related to urticaria, relief may be obtained by the administration of thyroid. It is possible that changes in the colloidal chemistry of the tissues, especially in faulty calcium metabolism, may play a rôle in the production of urticaria.

Purpura, another member of the group of exudative nonvesicular dermatoses, is encountered in association with metabolic disorders like rheumatism, cancer, tuberculosis, nephritis and diseases of the blood forming organs.

Dermatitis herpetiformis at times seems to be an anaphylactic phenomenon. Winfield reported four cases associated with glycosuria. Menstrual disorders, pregnancy and the puerperal state have been cited as causes of the disease.

Pruritis has been recognized as occurring in practically all diseases of metabolism, particularly in diabetes. For the intense pruritus of pregnancy and puerperium a diet low in proteins and the employment of ovarian extract alone or combined with thyroid, are recommended. For the treatment of pruritus and nothing acts so well as reducing the carbohydrates in the diet. Another obstinate type of pruritus accompanies endocrinasthenia.

In almost every case of xanthoma an increased cholesterin content of the blood may be detected. Xanthomas may occur in diabetes mellitus, and in diseases of the liver and biliary system. In one case under observation repeated examinations have revealed a cholesterin content of over 500 mg. to each 100 c.c. of blood. In a case of multiple xanthomata a cancer of the head of the pancreas was discovered.

Leucemia and Hodgkin's disease may involve the integument in the form of infiltrations, nodules, and tumors showing the microscopic characteristics of these diseases, or as erythema, urticaria, prurigo and purpura.

Sycosis vulgaris, furuncle and carbuncle constitute a group of pyogenic skin infections which are caused by staphylococci in individuals often showing disordered metabolism as in diabetes. General debility and diabetes predispose to their development. Hyperglycemia, carbohydrate fermentation and acidosis accompany almost half the cases.

It is not an easy task to indicate positively relationships between dermatoses and disorders of the endocrine glands. The field is still a virgin but a rich one. There is much hard work ahead and plenty of it for those who are undertaking these investigations, but the ultimate results are bound to be most happy. In order to be brief the skin diseases and symptoms which have been described in dysfunctions of the most important glands will be presented in tabulated form.

THYROID

erythema
urticaria
dermographia
pruritus
melanoderma
vitiligo
hyperidrosis
anidrosis
canites
alopecia
hypertrichosis
syncope
erythromelalgia
acrocyanosis
Raynaud's disease
scleroderma
angioneurotic edema
infiltrations
lipomatosis
xeroderma
ichthyosis
acne vulgaris
psoriasis
pityriasis rubra pilaris

ADRENALS

erythema
urticaria
dermographia
Sergent's line
pruritus
melanoderma
vitiligo
hypertrichosis
abnormal hair distribution
syncope
acrocyanosis
Raynaud's disease
scleroderma
erythromelalgia
angioneurotic edema
Recklinghausen's disease

PITUITARY

lipomatosis
abnormal hair distribution
hypertrichosis
anidrosis
hyperidrosis
scleroderma

GONADS

erythema
erythromelalgia
hyperidrosis
melanoderma
alopecia
hypertrichosis
pruritus
acne vulgaris
rosacea
lipomatosis

In this outline a brief presentation has been made of our knowledge concerning the relationship of the different dermatoses to metabolic disorders. Our minds, in the search for the truth, will confirm or disprove tentative opinions. In conclusion it is emphasized that it is very well worth while to remember that dermatology cannot be divorced from general medicine and that the data presented here have been of practical aid in the treatment of the dermatoses.

63 WEST SEVENTY-THIRD STREET.

The Grading of Epitheliomata and Their Radiation Sensibility*

By REX DUNCAN, M.D.,
and E. D. WARD, M.D.,
Los Angeles, Cal.

In over one hundred cases of epitheliomata in our institution during the past year, we have been able to make certain histological studies both before and after these tumors have been exposed to irradiation. Microscopic sections were made before radiation in order to determine, first, the degree of activity of the malignant cells, and second, to ascertain the particular cell type. After radiation, sections were studied at fixed intervals in order to determine the histological changes that had taken place.

Before entering into a discussion of the microscopic structure of the epitheliomata mention will be made of their gross salient features as they have routinely occurred to us. These neoplasms present many variations in size, shape and consistency; they may be ulcerated, flat, elevated or depressed, and the surface may be a greyish, pinkish, brownish, or black color. They may be moist, smooth, dry or scaly, and they may start in a small crack, ulcer, scale, leucoplakia or papilloma, or any portion of the body surface or in its orifices.

A more strict definition of epithelioma means a tumor composed of epithelium without any distinction relative to malignancy or benignancy. If we are to consider the specific cells lining the alimentary tract, and comprising the sebaceous, sweat and salivary glands as epithelium, then all the socalled carcinomata are also epitheliomata.

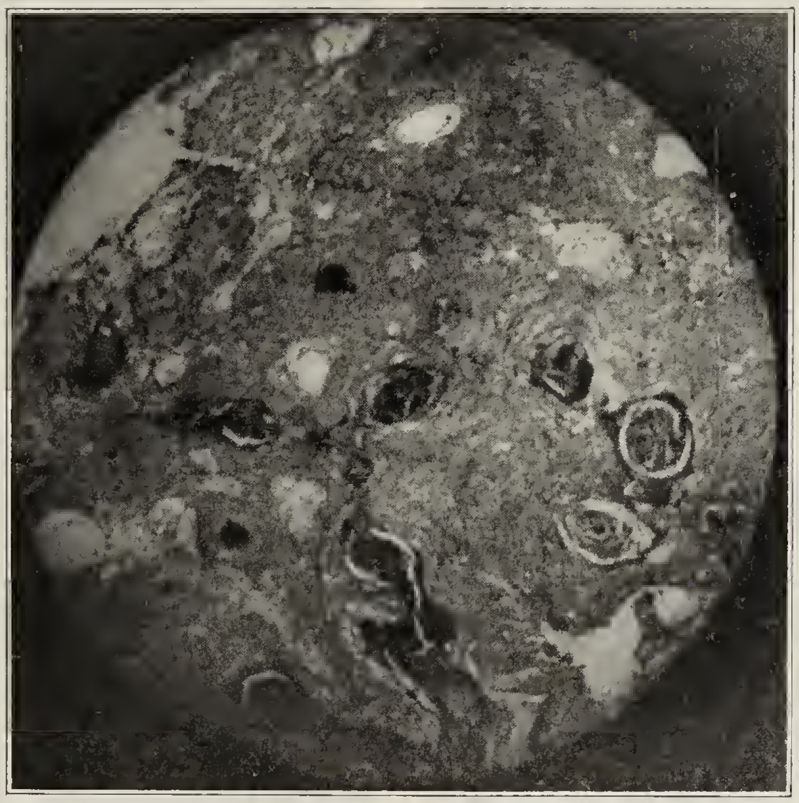

Fig. 1.—Acanthoma.

STRUCTURAL VARIATIONS

Structurally, the epitheliomata may fall within the following apparent types, which are the result of variations in origin and cellular differentiation: 1, Squamous cell epithelioma (Figs. 4 to 11); 2, melanoepithelioma (Fig. 2); 3, nonmelanotic melanoepithelioma (Fig. 6); 4, basal cell epithelioma (Fig. 3); 5, adamantine epithelioma, and 6, mixed cell epithelioma.

This discussion will be confined to those tumors composed of the skin and its appendages and since a large majority of the epitheliomata are of the squamous cell variety, it is this type of tumor with which we propose to deal here.

As its name indicates, the squamous cell epithelioma is composed largely of the cells of the squamous cell variety. These squamous cells may be made of many protoplasmic processes, some of which are seen connecting the cells. Hence we get the name of spindle or prickle cells. Other squamous cell epitheliomata may show many variations in size, shape and growth characteristics of their cells; some may show a marked tendency to cornify, that is, to approach closely the adult epidermal layer of the skin, especially those inside the cheek, lip, floor of the mouth, skin, etc., while those of the cervix, urinary bladder and antrum rarely do so. We see also mixed cell varieties, some of which resemble a round or spindle cell sarcoma while other varieties resemble morphologically all layers of the skin.

GRADING.

The most important factor with which we have to deal in epithelioma seems to be the degree of cellular activity. A great many epitheliomata show a marked tendency to differentiate, that is, to produce a growth whose cells resemble closely the normal. The pearl formation or pearly body is an example, and it corresponds to the horny layer of the epidermis. Other epitheliomata show no differentiation whatsoever, and in the large majority of the latter there are numerous mitotic figures. The more an epithelioma tends to differentiate, the lower is its degree of malignancy. Conversely, the more embryonal or more undifferentiated the cells, the higher the degree of malignancy. Upon these facts, Broders, in 1919, classified epithelioma of the lip into four grades or groups, and since that time he has extended this grouping to cover squamous cell epitheliamata in general. His plan of grading dependent upon the degree of cellular activity, is briefly as follows.

If an epithelioma shows about three quarters of its structure differentiated epithelium and about one quarter undifferentiated epithelium, with no mitotic figures and no socalled one eyed cells, it is graded I. (Figs. 4 and 5). If the percentage of differentiated and undifferentiated epithelium are about equal, with an occasional mitotic figure and one eyed cells, it is graded II. (Figs. 6 and 7). If the undifferentiated epithelium forms about three quarters and the differentiated about one quarter of the growth with numerous mitotic figures, it is graded III. (Figs. 8 and 9). When there is no tendency for the cells to differentiate, it is graded IV. (Figs. 10 and 11). The number of mitotic figures and the number of cells with large, deeply staining nuceoli, socalled one eyed cells play an important part in the grading. With some experience a definite picture of each grade becomes fixed in the mind and little difficulty is encountered in their classification. It must be remembered that not all cells with large, deeply staining nuceoli are malignant; however, when these cells are formed in a neoplasm in large numbers it is best to treat the tumor as malignant or premalignant. These cells are unquestionably regenerative and since malignancy is a regenerative destructive process, their presence is suggestive of malignancy.

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*Pathological Department of the Radium and Oncologic Institute.

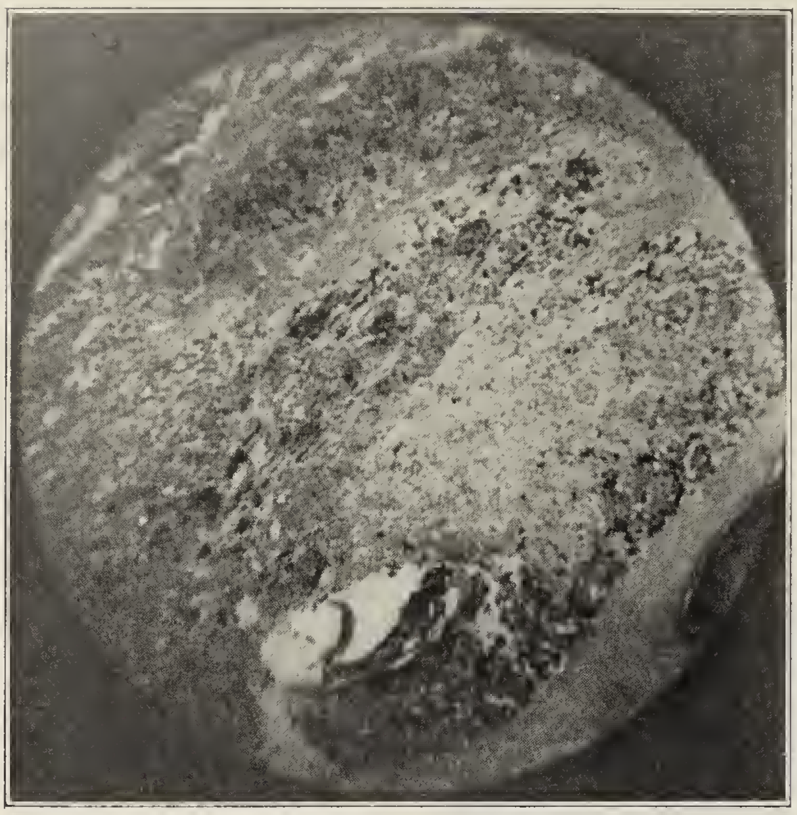

FIG. 2.—Melanoephithelioma.

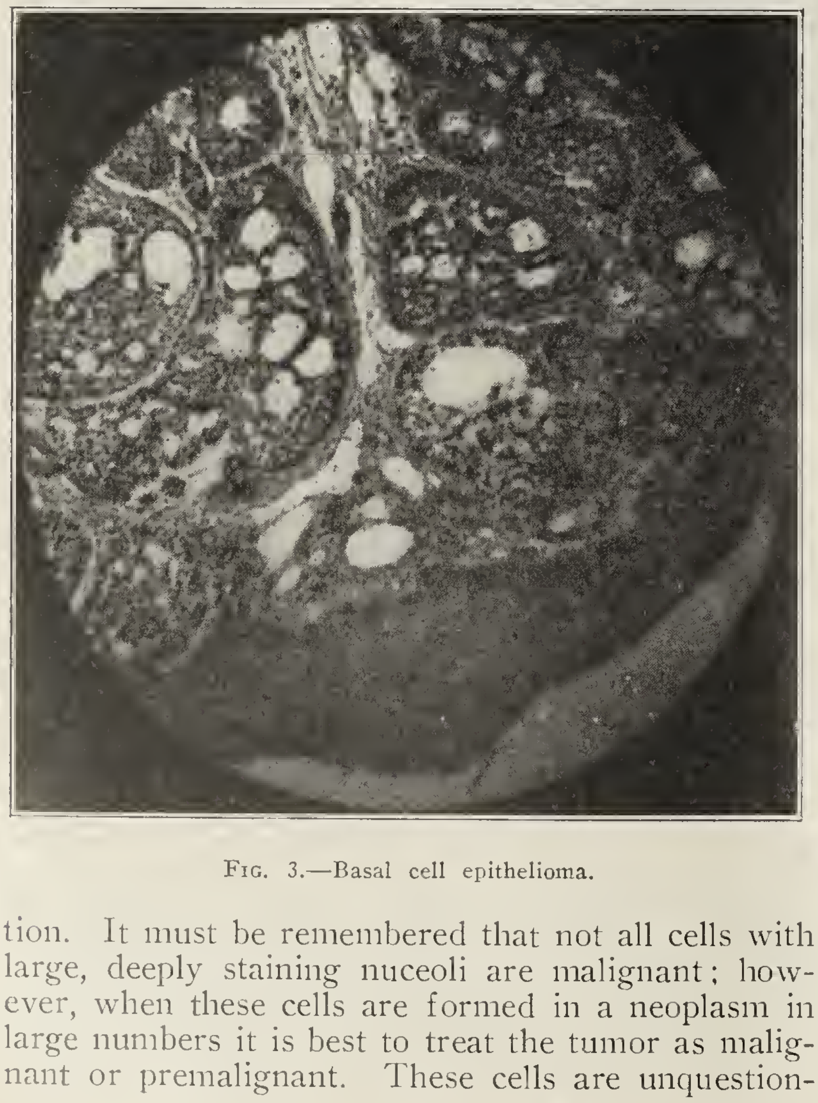

FIG. 3.—Basal cell epithelioma.

BIOLOGICAL EFFECTS OF RADIATION.

The mode of action of cancer cells to radiation is now in the process of investigation by pathologists, from both clinical and histological viewpoints. The specific physical agent is believed to act first upon the newly formed or embryonal cell, at the same time exerting a restraining and later destructive influence upon the sources of blood supply to the new growth. While these forces are acting, nature calls forth reparative processes and the result is a prolification of connective tissues. If the intensity of

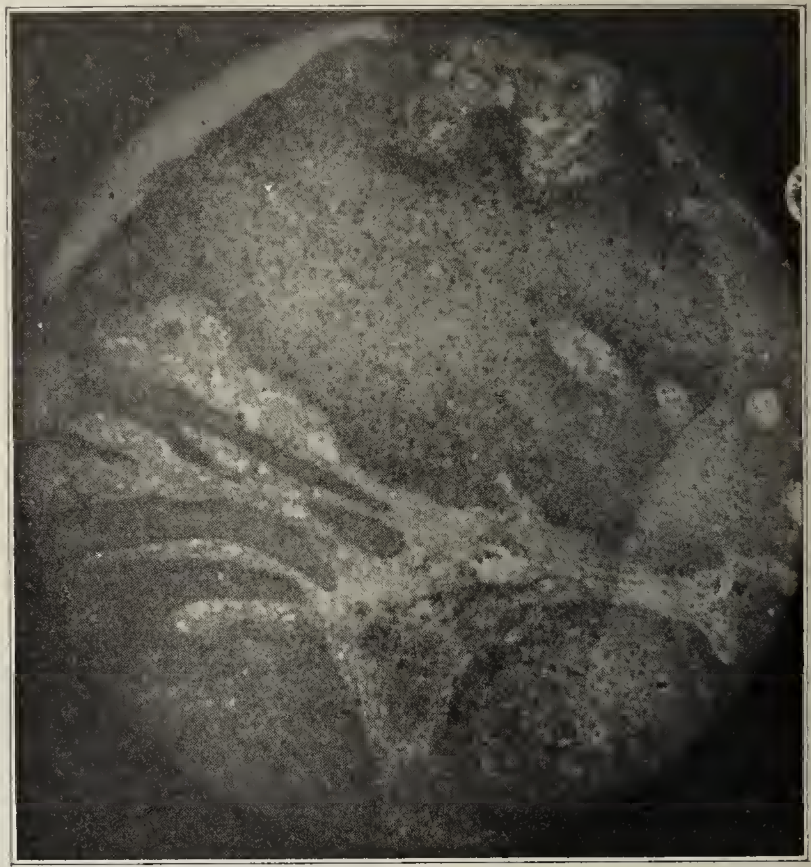

FIG. 4.—Squamous cell. Grade I, low power.

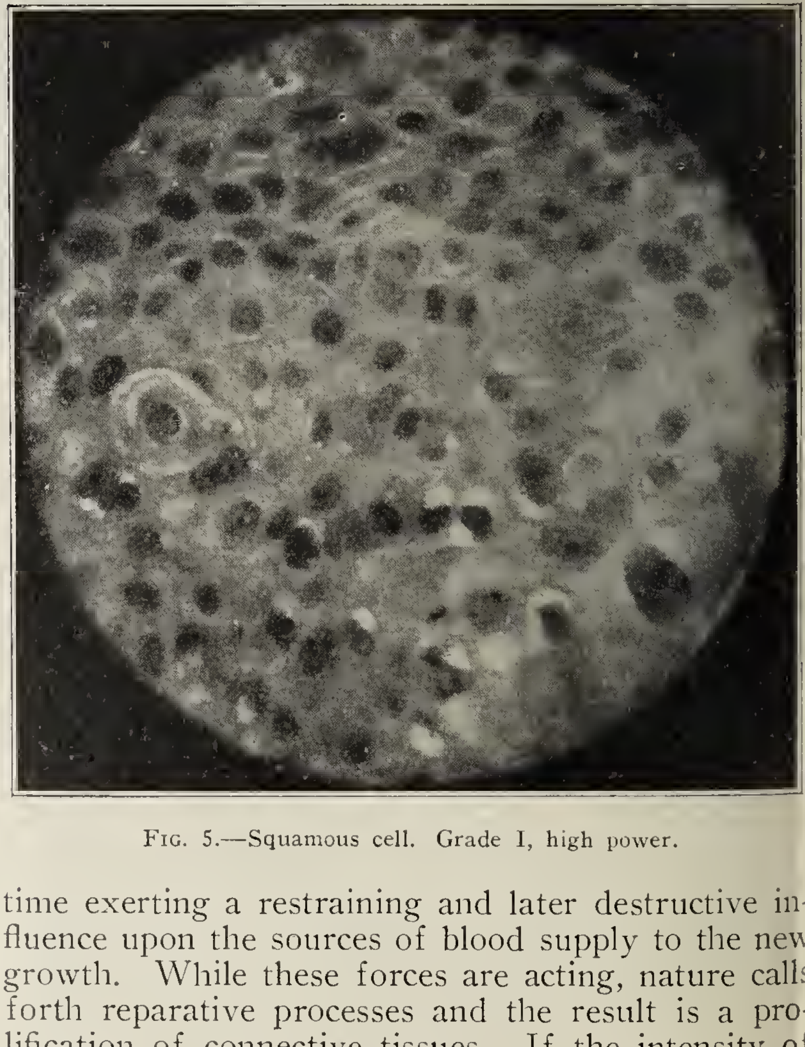

FIG. 5.—Squamous cell. Grade I, high power.

radiation is insufficient, the cells may be rendered dormant only temporarily, while if too intense, may be broken down and nature's resistant properties destroyed.

The difference in sensitiveness of cancer cells to radiation depends upon first, their age, the momentary period in which they happen to be; second, the age of the host; third, the histological species in each case. It is a universally accepted law of radiation that the more undeveloped, embryonal, and undifferentiated the malignant cells, the more sensitive they are to radiation.

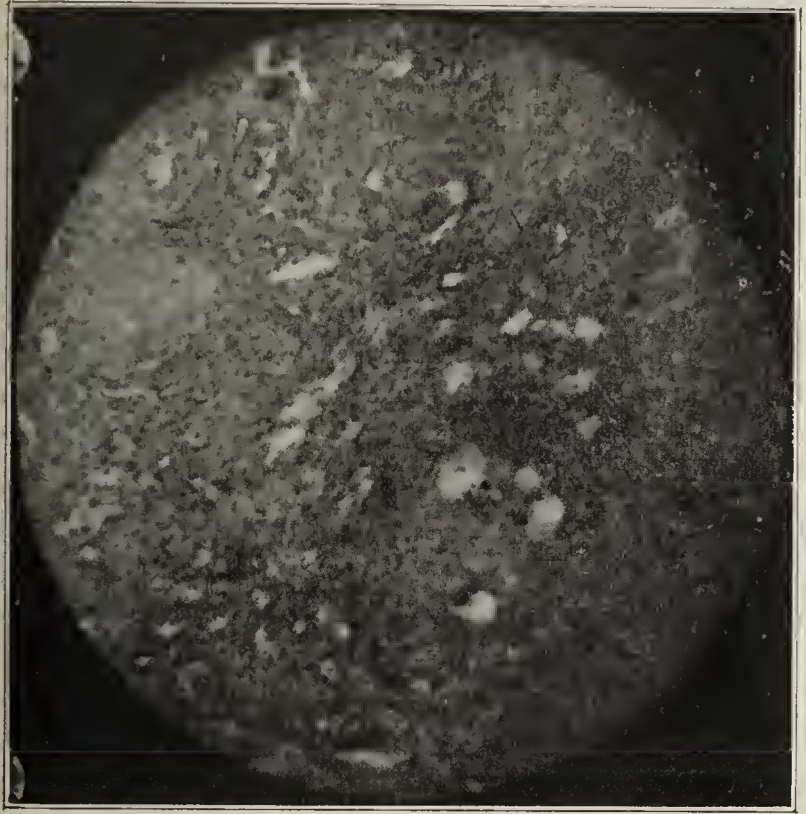

Fig. 6.—Squamous cell. Grade II, low power.

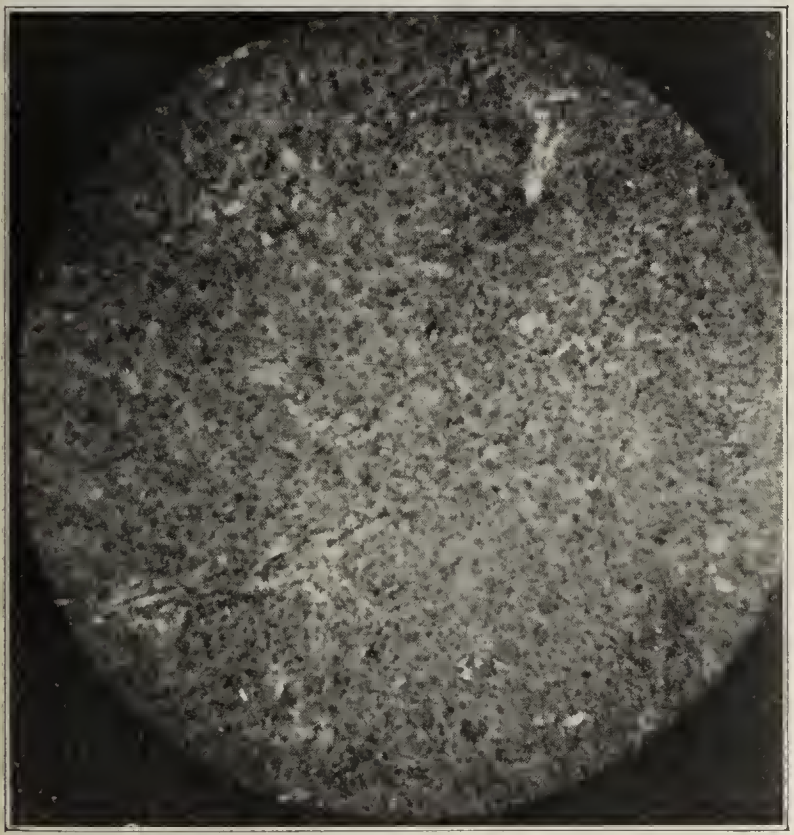

Fig. 8.—Squamous cell. Grade III, low power.

HISTOLOGICAL CHANGES.

The histological changes produced in the cancer cells, as a result of irradiation, are shown in the illustrations. It will be seen that these changes are similar for all four grades, and that the difference lies largely in the degree of sensibility. Grade one is the most resistant, while grade four is the most sensitive, with grades two and three occupying intermediary positions. The specific cell changes following irradiation seem to be as follows: within a few days we have observed a general hyperemia of the tissues, with a beginning of exudation of lymphocytes and polymorphonuclear neutrophiles. In the second stage all the surrounding tissues are more or less swollen. (Second to third week.) The nuclei of the tumor cells are swollen and homogeneous and the entire section is beginning to appear structureless. The cell bodies are enlarged and the cells

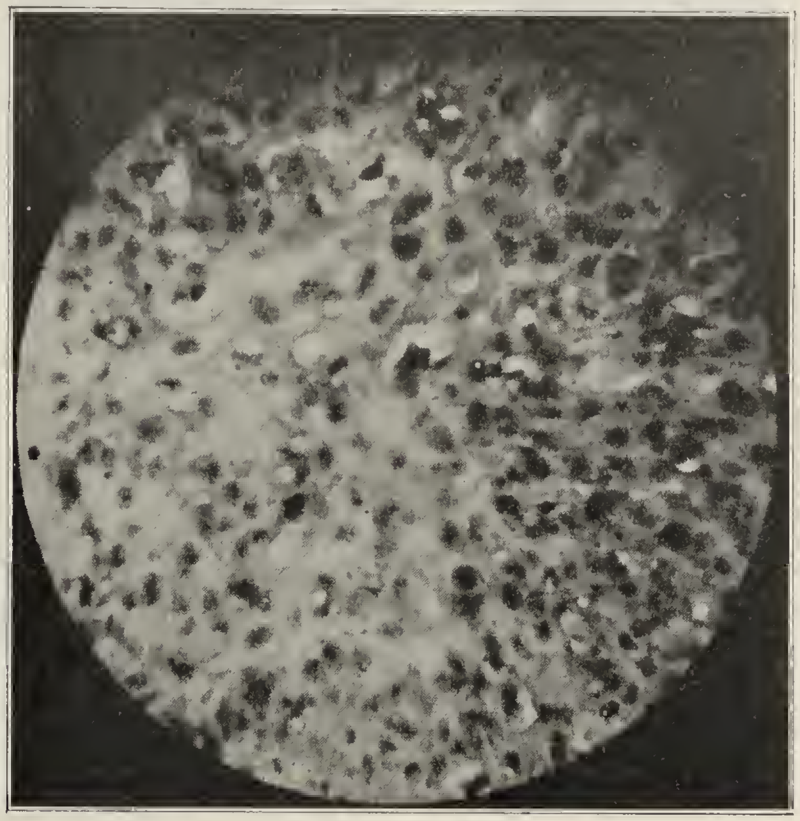

Fig. 7.—Squamous cell. Grade II, high power.

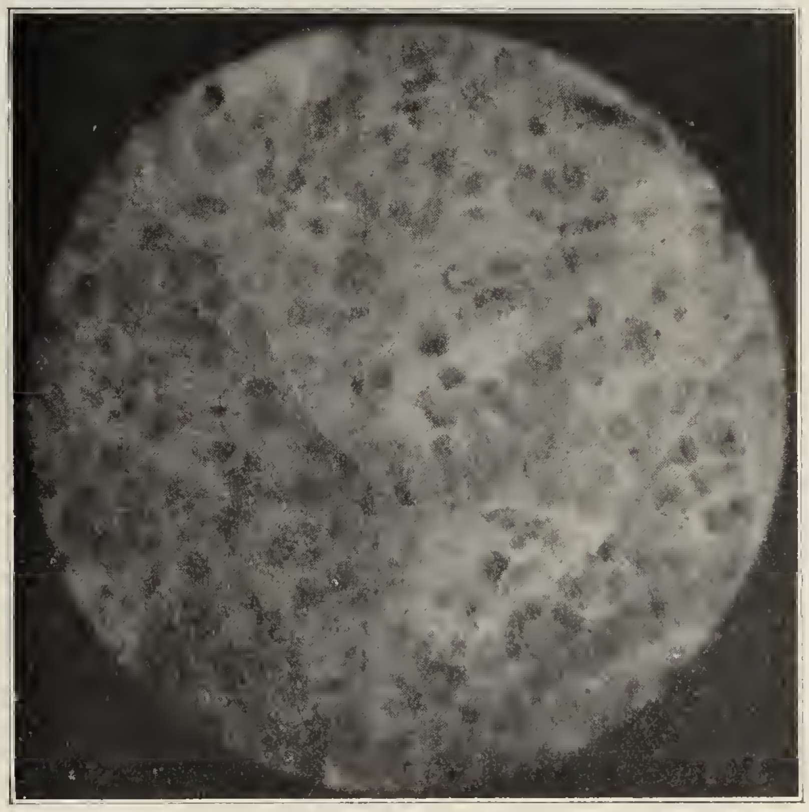

Fig. 9.—Squamous cell. Grade III, high power.

seem loosened and torn away. Vacuoles can be seen in the cytoplasm and fusion giant cells are present.

As this second stage progresses one will see liquefaction necrosis, reduction in the number of tumor cells, and a beginning invasion of lymphocytes and fibroblasts. In the third stage (Fig. 12) there are very important changes. The cells are practically all destroyed, or else so shrunken and encapsulated by fibrous connective tissue that they are inactive. Fragments of nuclei and giant cells remain, the former being actively removed by the phagocytic action of the exudated leucocytes. This stage progresses immediately into the fourth stage (Fig. 13), or stage of fibrosis. The areas of liquefaction necrosis have been replaced by fibrous tissue, and the strauma of the tumor is nothing more than granulation tissues rich in capillaries. The illustrations will show how the fibroblasts permeate the tumor cell nests and spread in all directions. This connective tissue breaks open the cell complexes, presses them together and strangulates them. The hemorrhages which take place very soon after radiation and which are caused by the destruction of the blood capillaries, are organized and replaced by the fibrous tissue.

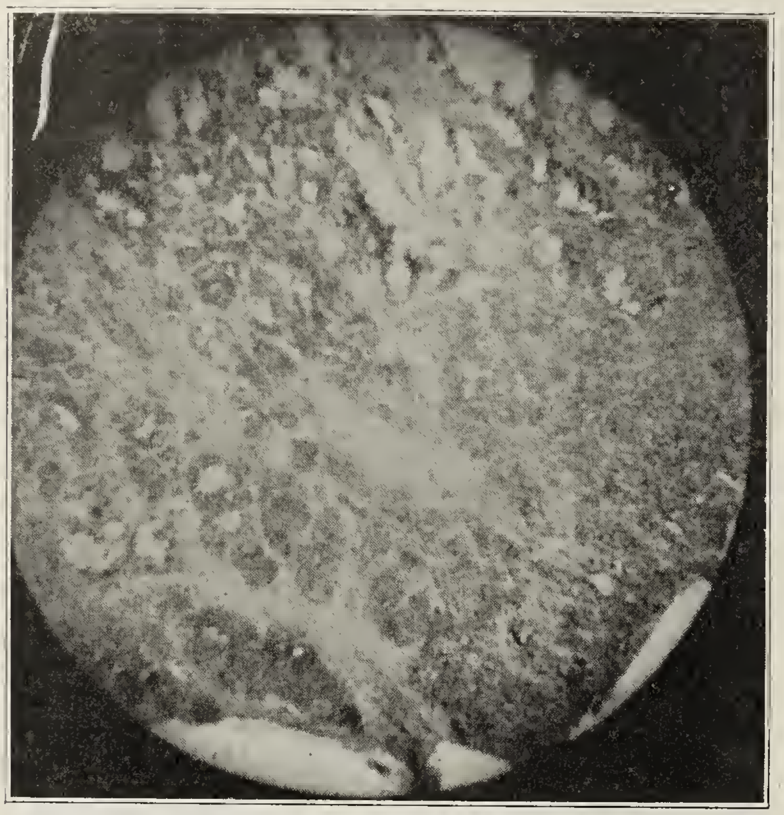
Fig. 10.—Squamous-cell. Grade IV, low power.

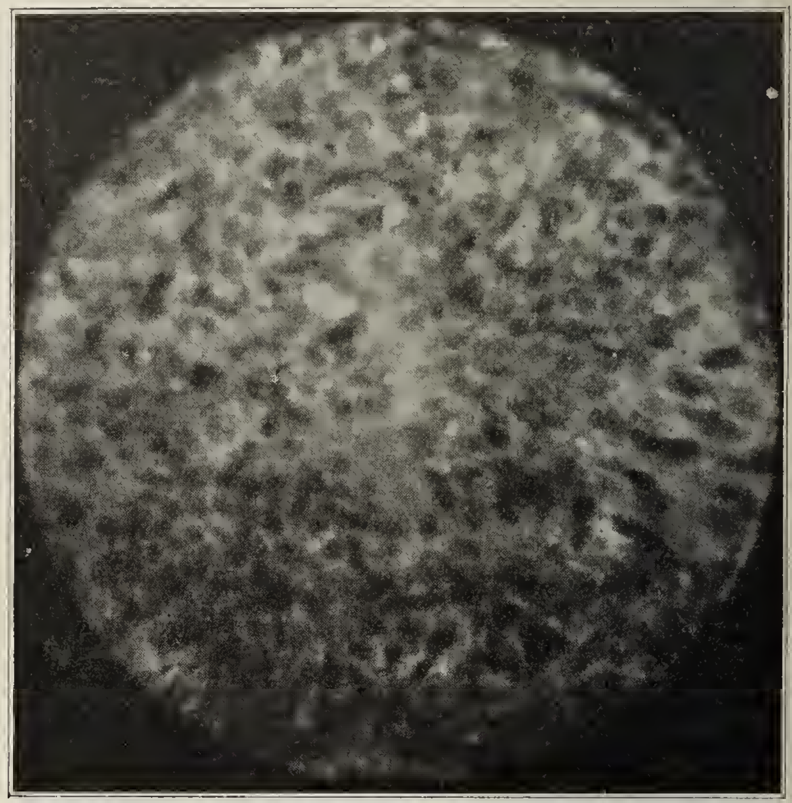
Fig. 11.—Squamous cell. Grade IV, high power.

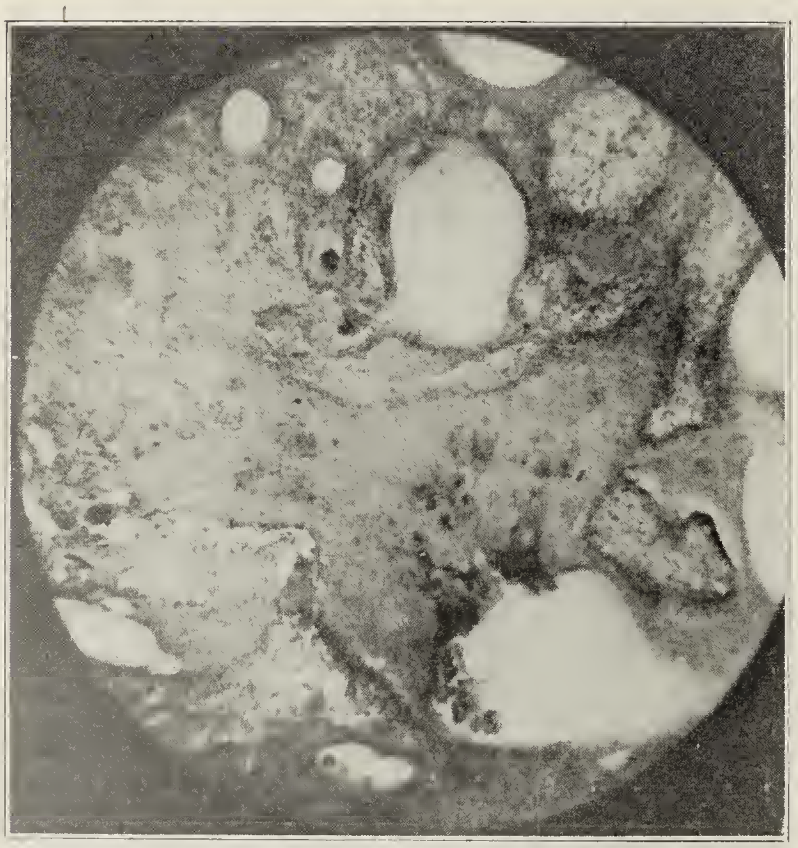
Fig. 12.—Squamous cell after radiation. Third stage.

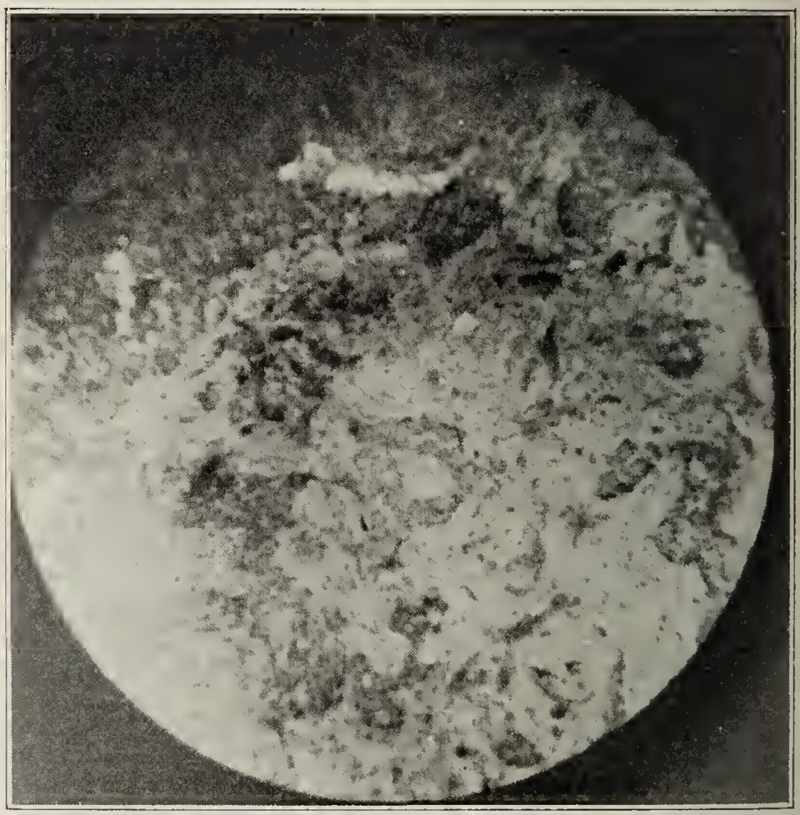
Fig. 13.—Squamous cell after radiation. Fourth stage, showing fibrosis.

Finally, this connective tissue shows signs of maturity, the cells diminish in number and only the scar remains.

1151 West Sixth Street.

Hypertrichosis and Its Treatment*

By LAWRENCE K. McCAFFERTY, M.D.,
New York.

Excessive growth of hair confined to the face is common in women. It is here that the physician may render a real service. Most women are sensitive about even a few hairs upon the face, but when there is a real overgrowth they may shun society, live secluded lives or even become melancholic. By careful treatment the worst cases may be cured, and the patient is returned to society with a healthy outlook upon life.

KINDS OF HYPERTRICHOSIS.

We have two main divisions of hypertrichosis—congenital and acquired. The congenital type may be partial or universal. The partial type of congenital hypertrichosis is best represented by the hairy mole. The universal congenital type is rare but does exist. The Russian dog faced boy was an example of this latter type. Unna (1) believes that at the time of birth the fine papillary hairs of the embryo continue to grow, producing either localized (Fig. 1) or universal congenital hypertrichosis.

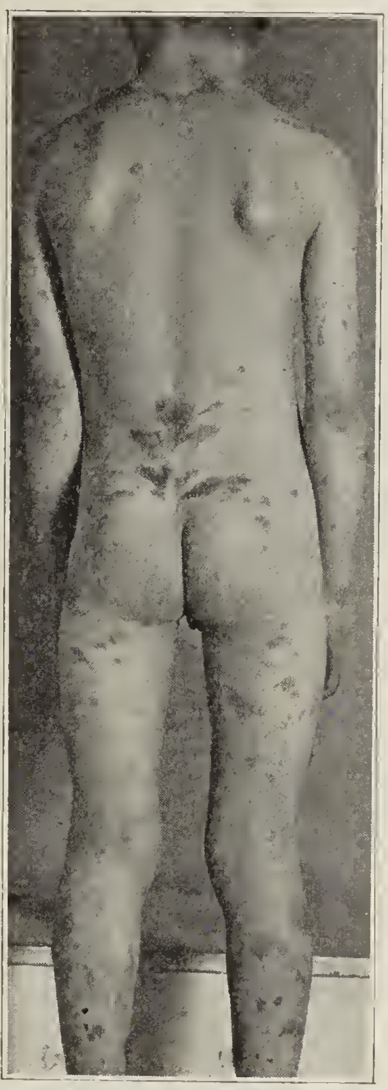

Fig. 1.—Localized congenital hypertrichosis.

ACQUIRED HYPERTRICHOSIS.

Acquired hypertrichosis is the type which interests us the more. It occurs in women usually between the ages of eighteen and thirty who have a noticeable amount of hair upon their faces. In women past the climacteric, one sees only a few scattered hairs or an occasional tuft. In young women Jackson (2) found the lip involved in twelve per cent.; the lip and chin in 38.5 per cent., and cheeks, chin and lip in thirty-four per cent. The hair in blondes at first is barely visible, while in brunettes it is pigmented and stands out sharply. The patients may use depilatory creams, tweezers or the razor. The hair is gradually changed from a fine, hardly noticeable lanugo to very thick, coarse hair similar to that of a man's beard.

ETIOLOGY.

The etiology of acquired hypertrichosis points to a disturbance of the endocrine system. Falta (3) states that a pathological process beginning in one gland will, to a greater or less degree, cause disease in all the others. The internal secretion of one gland reaches another through the circulation and there either increases or inhibits functional activity.

Draper (4) reported two cases with a pathological disturbance of one endocrine gland. The first patient presented in each kidney region a small hard tumor. She made a striking picture of virilism with secondary sex characteristics. Hair appeared on the face and body late in life. The condition was evidently due to tumors of the adrenal cortices. The second case reported by Draper (a case which I had the opportunity of seeing and studying) presented a mass in the pelvis connected with the uterus. She has had hair upon her face since her eighteenth year and it is still increasing. The male secondary sex characteristics are strongly developed, especially in the face. This is shown by her expression as well as the distribution and coarseness of the hair (Fig. 2). Draper thought this to be due to a tumor of the ovary. Alfred Callais (5) reports several cases of suprarenal tumors with marked secondary sex characteristics usual to the opposite sex. Progressive hypertrichosis in these women was one of the subjective symptoms which first brought the patient to a physician. Bechet (6) believes that hypertrichosis is the result of functional organic derangement of the ovaries.

Cushing (7) observed that during the period of activity of acromegaly hypertrichosis increased. He found that the adiposogenital syndrome occurred with derangement of other ductless glands than the hypophysis. He cites a case of a young woman aged nineteen who had a grown beard and moustache. At autopsy they found a malignant adenoma of the left suprarenal gland. Biedl (8) states that during pregnancy the influence of metabolism which is undergoing changes, as well as the modification of internal secretory glands, leads to manifestations such as increased hair growth. Pregnant rabbits show a striking growth of fur.

After physiological senile atrophy and pathological degeneration of the ovaries have taken place, often, but not always, a heterosexual change has been observed accompanied by the occasional development of a beard. Heredity, no doubt, plays a rôle in the development of hypertrichosis which, however, does not manifest itself until after puberty. It is no doubt true that the overgrowth of lanugo is possibly due to the disturbance of endocrines. However, with the exception of such cases as Draper's, hair which develops from coarse lanugo is undoubtedly due to mechanical irritation.

TYPES OF PATIENTS

The types of patients presenting themselves for treatment vary to a great extent. Briefly these may be grouped as follows:

The patient who has a very fine white lanugo on the upper lip and sides of the cheeks. The hair is noticeable only to herself and should not be removed unless it is affecting her personality. The second type is the brunette who has a short, fine black lanugo on the upper lip. This is natural for a dark complexioned person. It adds a certain artistic picture which is natural for that type of individual.

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*From the dermatological service of Dr. H. H. Whitehouse at the New York Skin and Cancer Hospital.

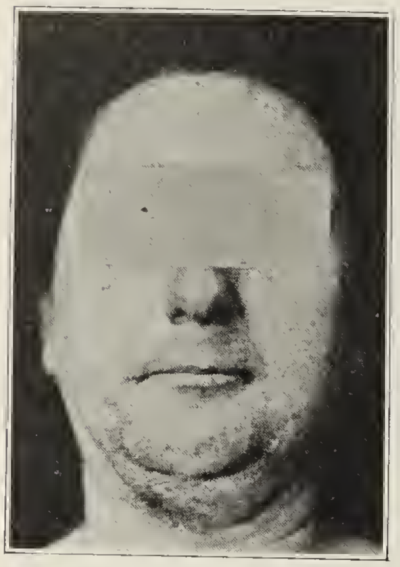
Fig. 2.—Secondary sex characteristics and hypertrichosis shown by the subject's expression as well as the coarseness and distribution of the hair.

The third type is the blonde who presents a very fine, long lanugo hair which has become pigmented at the ends. This usually occurs on the upper lip, especially above the commissures and on the chin following the rami of the inferior maxillary bone. This condition is an indication for electrolysis. The fourth type is the brunette presenting long fine black hairs appearing on the upper lip and chin. Electrolysis is here recommended. The fifth type is either blonde or brunette, usually the latter, presenting an excessive growth of hair on the sides of the face, the neck above the hyoid bone, the chin and sometimes the upper lip (Fig. 3). Much may be done by electrolysis for such a patient.

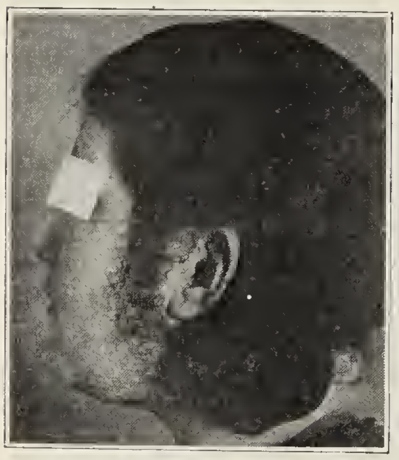
Fig. 3.—A type of hypertrichosis presenting an excessive growth of hair on the sides of the face, chin, and upper lip.

The sixth type is the patient who shows coarse, stiff, long hairs, either light or dark, depending upon the complexion of the individual. The hairs usually occupy the same regions as the male beard (Fig. 2). This type of hair is indicative of a heterosexual tendency, or that the individual has persistently extracted the hairs. It may be due to a combination of the two. This condition is a real indication for treatment. The seventh and last type represents those women during, or several years after, the menopause, who present either small tufts of hair in one or two places on the face (Fig. 4), or several long coarse hairs scattered over the face.

ELECTROLYSIS.

Giovanni (9) states that the changes produced in the single hair follicle as well as in the hair matrix and sheath of the hair are so great that electrolysis may be considered successful. The apparatus necessary is well known to all. It has been my practice, thanks to the instruction of Dr. George M. MacKee, to use a needle holder, etc., which will permit the needle to be placed at any angle. By using this holder, the hand may rest upon the face and prevent tremor of the fingers. The needle should be extremely fine and pointed. The electrode, which is the positive pole, may be about three inches square and is covered with wet absorbent cotton. The needle holder is attached to the negative pole. This should never be reversed. If it is, the current will cause a charring of the tissues and a black spot will remain permanently. T. C. Gilchrist (10) has found the use of a magnifying lens valuable in doing this work. Daylight is preferable for this work, but it may be done at night by the aid of a blue tungsten light.

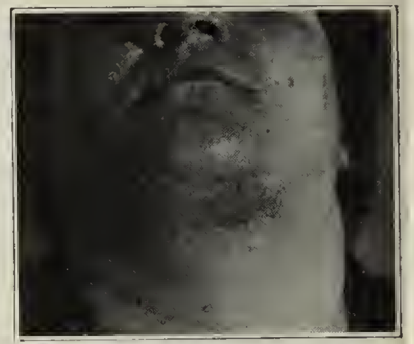
Fig. 4.—A type of hypertrichosis where the hairs are arranged in tufts.

There are a few things one should bear in mind in order to obtain the best results. As a general rule one half milliampere on the upper lip and on fine lanugo hair has been found best. For all other locations on the face when one is dealing with hair that is coarse and deeply imbedded in the subcutaneous tissue one milliampere is suggested. It was never necessary to go above this amount. It has been found advisable to equip oneself with a milliampere meter which may be placed near the operator's head. The distance between each milliampere should be about an inch. This will make it possible for the operator to read accurately from one tenth to one milliampere. One may use the same milliamperage each time upon the same patient, thereby obtaining uniform results.

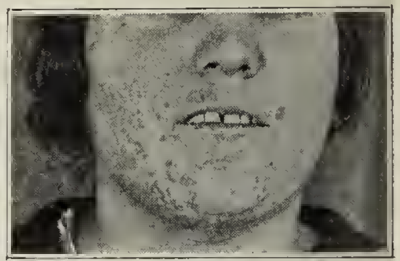
Fig. 5.—Sequelæ of x ray treatment for hypertrichosis.

The needle should be placed directly into the follicular mouth, following the hair follicle to a depth varying from one sixteenth to three sixteenths of an inch. If the needle does not enter the hair follicle it meets with resistance and a blanching of the skin occurs around it. If the needle is properly inserted, a white foam or froth exudes from the hair follicle. This is due to the liberation of hydrogen within the hair follicle. While the needle is still in place, the hair is removed with the slightest traction. When noticeable traction is necessary, it means that the hair bulb is not completely destroyed, in which case the operator should return to it in a few minutes and by the slightest traction it will slide out. The electrolytic action evidently continues for several seconds after the needle has been withdrawn.

A few minutes after the hair has been lifted from the follicle, a tiny brown halo appears, showing that destruction has occurred. Following this there appears a pin point sized umbilicated vesicle which is slightly yellow; later a slight edema or wheal appears. The above reactions are increased and hastened by increasing the milliamperage. In twenty-four hours a small crust forms over the umbilicated vesicle. A scab generally falls within a week, leaving a brownish red pigmented spot. The pigmentation fades completely in three to six weeks, leaving in some cases a barely noticeable white scar, whereas in other cases no visible trace is left.

NUMBER OF TREATMENTS REQUIRED

The number of treatments required for a patient with hypertrichosis varies with the amount and type of hair. Lanugo hair may be removed at the rate of one hair every thirty seconds, using one half of a milliampere. Coarse, stiff, deeply imbedded hairs will require one minute at one milliampere. Hairs from a mole require two minutes at one milliampere. Two or three weeks after the hairs have been removed from a mole, one will notice that the mole has partially disappeared. It is advisable to remove the remaining pigmentation. Care should be taken that the patient is not subject to keloidal formation for obviously a keloid will develop on the nevoid site. The hairs upon any location should not be removed too closely, otherwise the area will become edematous and indurated. When the induration has undergone involution, scarring or atrophy may remain.

A few hairs do return after electrolysis. This is due either to insufficient destruction of the hair papilla or to a curving of the hair root in the subcutaneous tissue. The curving root is found usually on the anterior neck. When all the coarse hair has been removed from a case such as Fig. 3, a fine lanugo may grow. Brocq (11) calls this a secondary growth. He states further that even a third growth may appear. This, however, is the exception rather than the rule.

HISTOLOGICAL CHANGES RESULTING FROM ELECTROLYSIS.

The histological changes have been worked out by Giovanni in a most exhaustive article. He found the effect of electrolysis extended far and near. The sebaceous and sweat glands nearby either undergo atrophy or are destroyed. The fat cells are pushed away from the hair follicle and degenerate, leaving cavities. The lanugo hairs in the neighborhood are destroyed. Scar tissue closes up the hair follicles by the ninth day while in the subcutaneous tissue around the hair papilla scar tissue continues to form until the fifty-eighth day. A slight pigmentation remains at the epilated hair follicle fifty-eight days later.

X RAY TREATMENT.

X ray treatment of hypertrichosis fortunately is relegated to the past. A few years ago several dermatologists who were skilled also in x ray therapy believed that they had finally found an agent which would permanently cure hypertrichosis, but after they had seen the end results of such treatment they gave it up in despair. It requires from one to one and one quarter skin units unfiltered (measured dosage of Remer and Witherbee) (12) to cause a defluvium upon the face. This dosage is the same as one or one and one quarter Holzknecht units at skin distance unfiltered. The hair will regrow in from one to three months unless one skin unit unfiltered or a slightly smaller dose is repeated. This dose should be repeated every six weeks for a total of from six to eight treatments before a permanent result is effected.

One skin unit unfiltered will almost always produce an erythema in blondes; repetition of such dosage is almost sure to produce sequelæ (Fig. 5), such as telangiectasia, atrophy, wrinkling, and pigmentation. Such sequelæ do not occur usually before one or two years and are permanent. The erythema from filtered radiation will produce the same sequelæ. Until such end results may be avoided, x ray should not be used in treating hypertrichosis.

RADIUM TREATMENT.

Radium has been used by Heidingsfeld (13), Speder (14), and others, but inasmuch as its action is similar to x rays, it will not be discussed.

DEPILATORIES.

Depilatories when continuously used may cause a chronic dermatitis, although some patients have used them for years with apparently good results. Their principal ingredient is barium sulphide. It may be mentioned here that cold creams especially those containing lanolin, are accused of stimulating lanugo hair. I cannot agree with this nor have I been able to find any reference to such an action in any of the literature that has been written on this subject.

CONCLUSION.

I wish to express my thanks to Dr. John A. Fordyce for permission to photograph and publish some of the cases that came under his service at the Vanderbilt Clinic; to Dr. George M. MacKee I am especially indebted for his many valuable suggestions and for the privilege of studying and photographing private patients, some of which are used in this article; to Dr. George Draper, for the privilege he extended me at the Presbyterian Hospital in studying one of his cases, as well as the use of the photograph, and to Dr. H. H. Whitehouse, for his kindness in allowing me to publish one of the photographs from his clinic.

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Pruritus with Lichenification

Further Observations on Neurodermitis of Brocq or Lichen Chronicus Circumscriptus of Vidal

By FRED WISE, M.D.,
New York.

Numerical data pertaining to the occurrence of diseases classed under eczema in the local dermatological clinics present wide variations and gross discrepancies. The reason for this is not far to seek: an active and busy clinic will fall into the habit of conveniently classifying certain dermatoses under the caption of eczema, thereby swelling the eczema statistics to disproportionate dimensions. Among the affections giving rise to confusion the commonest are the industrial dermatoses, dermatitis venenata, dermatitis artefacta, the dermatophytoses, pompholyx and dysidrosis, and, lastly, the circumscribed and diffuse forms of pruritus with lichenification (neurodermitis of Brocq).

In the past five or six years the majority of these conditions have been more carefully distinguished and more properly classified; in fact, there are indications that the pendulum is beginning to swing in the opposite direction, for the dermatophytoses are by way of getting more than their just share of blame for many obscure types of dermatitis. But when it comes to Brocq's neurodermitis, which at least in New York is certainly a common disease, clinically resembling eczema, but in reality not eczema at all, we find that this entity is still subjected to the humiliation of being incontinently flung upon the eczema refuse heap by the majority of American dermatologists.

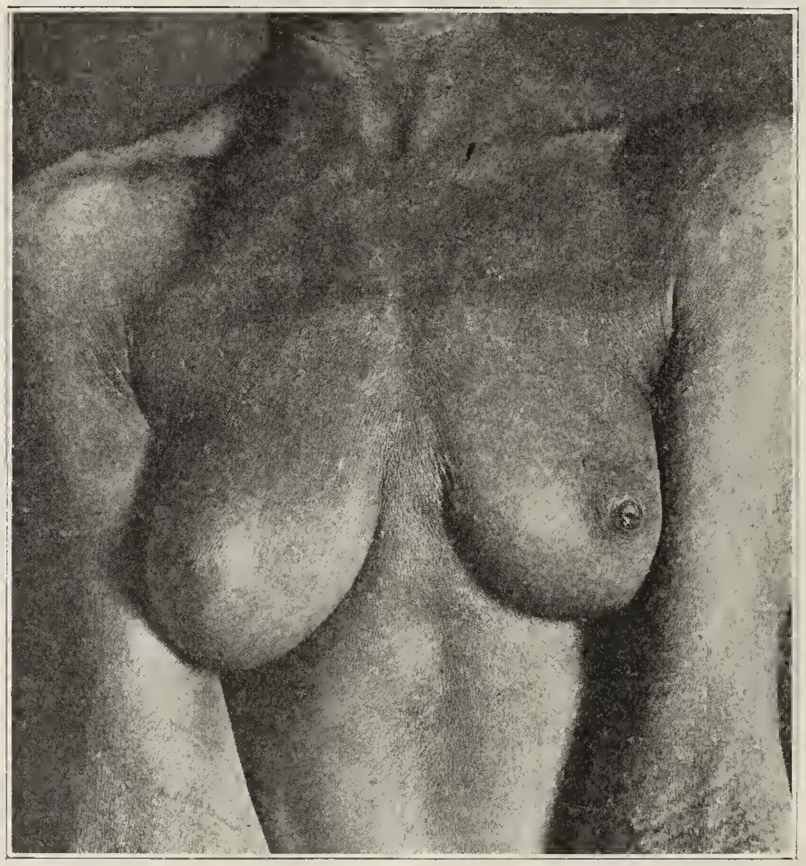

FIG. 5.—Neurodermitis, diffused type. Showing characteristic lichenification of entire cutaneous envelope. Private patient, a victim of chronic hayfever and asthma. (From author's article in *Jour. Cutan. Dis.*, September, 1919, p. 590.)

In his careful and elaborate work on pruritus with lichenification, Brocq (1), adequately covered the entire ground. As stated in a previous paper (2) on this subject, his writings in this particular field have not been sufficiently read and studied by his colleagues in other countries. Had they been more carefully perused and memorized, our statistics on eczema would have undergone many revisions. Vidal, Besnier, Brocq, Jacquet, Touton, Neisser, and many others after them have demonstrated that pruritus with lichenification, or neurodermitis, is not eczema, any more than it is lichen planus, despite the fact that it occasionally does resemble one or the other of the two latter diseases. It is a disease entity and requires no support to stand by itself. Clinically, syphilis often is indistinguishable from lupus vulgaris; psoriasis from seborrheic eczema; tuberculosis from blastomycosis; scarlet fever from a drug rash. The manifold resemblances to each other, of different forms of dermatoses, cannot be invoked as arguments in favor of any relationship between them. Eczema, lichen planus and neurodermitis are three separate and distinct dermatological entities.

In this connection, mention should be made of an article published by M. Dind (3), of Lausanne. This author reviews the relevant publications on the subject, including the clinical and histological features of the disease, and by various obscure and devious paths, he comes to the amazing conclusion that all forms of lichenification are practically identical with lichen planus, and belong, etiologically, to the infectious and parasitic group of skin diseases. Every man has a right to express his opinions and to publish them broadcast if he wants to, but one can safely surmise that had Dind permitted "his friend and master," Brocq, to read his paper prior to its publication, no such jumble of dermatological distortions would have graced the pages of the foremost French journal devoted to diseases of the skin.

Lichenification and lichen planus should never provoke confusion, even in the minds of beginners. Lichenification and eczema are often justifiably confused, even by the expert. The first two differ vastly in their mode of origin, in their incidence as to age of patients, in their areas of predilection on the body, in their gross clinical appearances, in their histological structure, in their course, sequelae and terminations; last, but not least, they differ in that lichen planus attacks the mucous membranes, while pruritus with lichenification does not, Dind to the contrary notwithstanding.

Primary lichenification may well be the first clinical evidence of leukemia and pseudoleukemia (see Fig. 1), mycosis fungoides and other dermatoses having not the remotest relation to lichen planus. Secondary lichenification may supervene in almost any affection associated with severe itching and scratching, as it often does in pruritus cu-

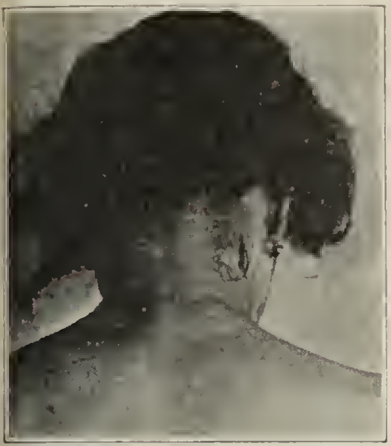

Fig. 1.—Primary lichenification of the skin of neck and shoulders, in a case of pseudoleukemia cutis. Diagnosis confirmed by microscopic examination of skin. Note crosshatching and wrinkling of skin. (Vanderbilt Clinic patient.)

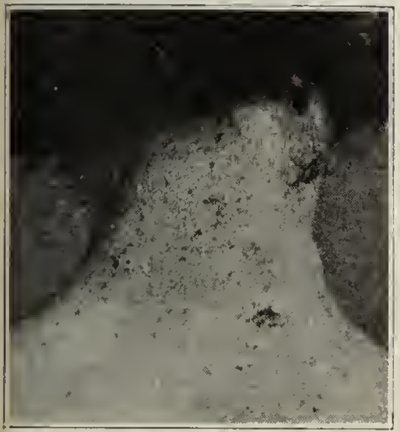

Fig. 4.—Secondary lichenification from scratching, in pediculosis capitis. Note characteristic crosshatching of skin. (From author's article in *Jour. Cutan. Dis.*, September, 1919, p. 590.)

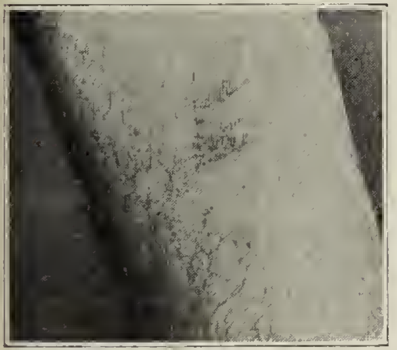

Fig. 7.—Neurodermitis, circumscribed type. Popliteal area of an adult male, showing the characteristic crosshatching of the skin.

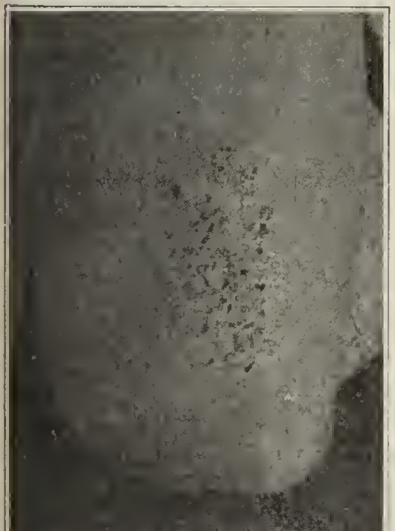

Fig. 9.—Neurodermitis, circumscribed. Elbow of adult male, showing typical lichenification and secondary crust formation, from scratching.

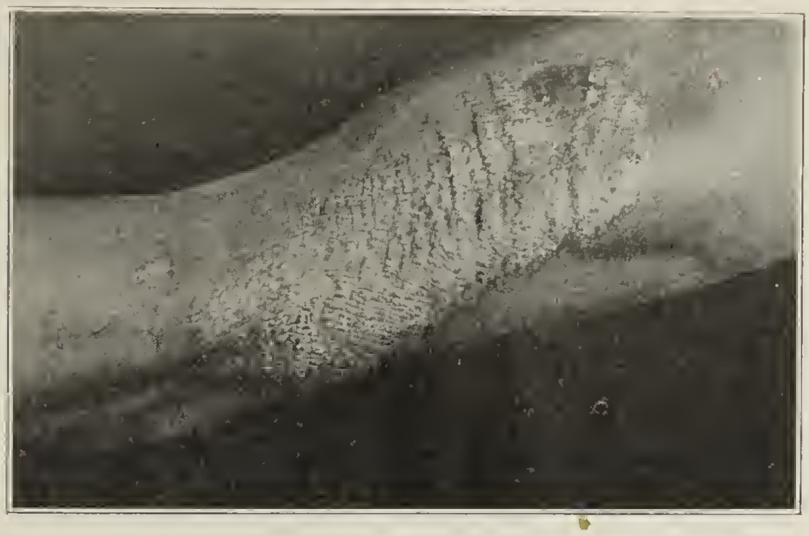

Fig. 3.—Neurodermitis, localized and sharply circumscribed. Note typical crosshatching and quadrillation. Arm of adult male. (Vanderbilt Clinic.)

taneus, scabies, pediculosis, eczema and dermatitis, and even in lichen planus itself. The resemblance between lichenification and lichen planus lies in their names only.

In the article previously mentioned (2) I submitted a free translation of Brocq's work on pruritus with lichenification, in the hope that a perusal of it would tend to induce the reader properly to classify the affection, if only for the sake of rectifying existing errors as to figures bearing on the incidence of eczema.

Briefly recapitulated, the salient features of pruritus with lichenification are as follows: There are two main varieties, the primary and secondary. The eruption may be circumscribed or diffused; it may attack an area as small as a silver half dollar and remain restricted for months or even years to such a small patch, or it may involve almost the entire skin. Such circumscribed and diffused examples are described and illustrated in the preceding article (2). The primary variety results from protracted scratching and rubbing of an area of skin which is pruritic, but which, in the beginning, presents no visible lesions. The itching may precede the visible changes in the skin for months. This continued trauma, acting in conjunction with other factors residing within the affected individual, such as hay fever, asthma, bronchitis, gastrointestinal disturbances, perhaps excessive indulgence in tea, coffee and alcohol, and possibly certain obscure anaphylactic and endocrinous phenomena, results in a patch of neurodermitis. A goodly proportion of patients with neurodermitis present evidences of an unstable nervous system: irritability, excitability and neurasthenia are not infrequent concomitants. In children ranging from four to sixteen years, we see the patches most often in the cubital and popliteal spaces; in adults, more often on the nape and sides of the neck, the extensor surfaces of the knees and elbows, and the perigenital regions. No part of the cutaneous surface is exempt, however.

There is a peculiar and interesting clinical form of the primary variety of which I have encountered only three examples, all in children. The eruption is limited to the lower portion of the buttocks, the gluteofemoral fold and the upper posterior aspect of the thigh. The first case of this kind of which I have any knowledge was presented about five or six years ago, before the dermatological section of the

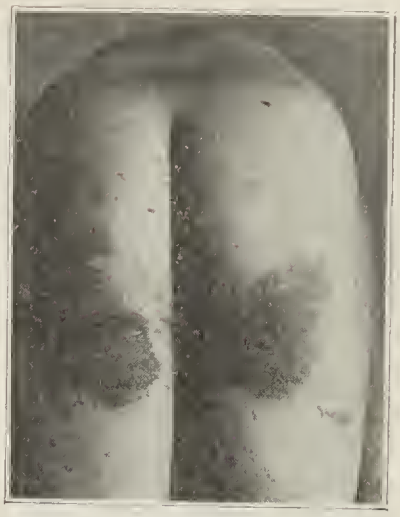

Fig. 2.—Pruritus with lichenification (neurodermitis). S. G., boy, aged 6. Private patient. An unusual localization, not due to external irritation, or contact with irritants on chair or toilet seat. Patches are papular and lichenified, never moist like eczema.

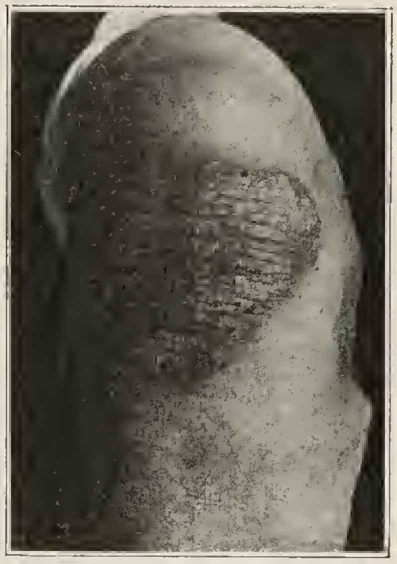

Fig. 6.—Neurodermitis, localized and sharply circumscribed. Note typical transverse and longitudinal crosshatching.

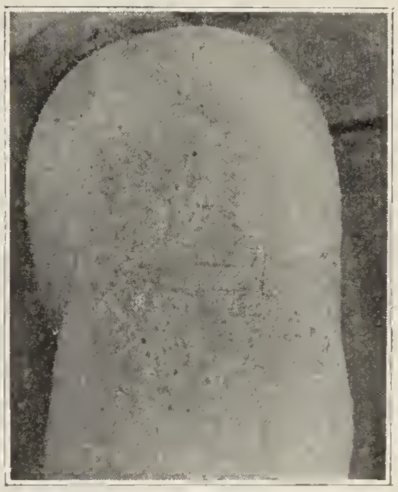

Fig. 8.—Neurodermitis, localized. Knee of adult female, showing lichenification, crust formation and scratchmarks.

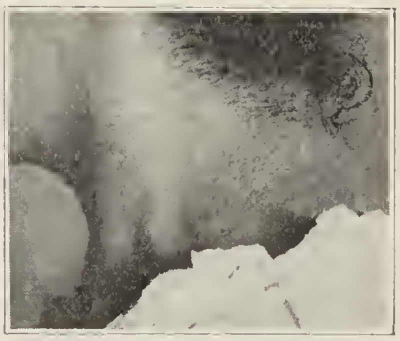

Fig. 10.—Neurodermitis, circumscribed, showing characteristic lichenification.

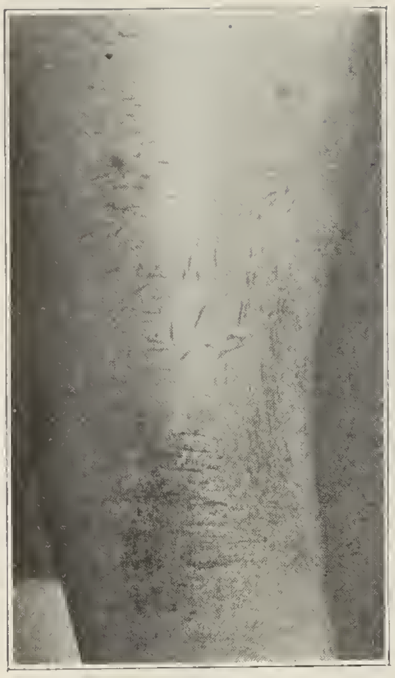

Fig. 11.—Neurodermitis, localized. Showing characteristic lichenification in popliteal space of a child, a common area of predilection in children. (From author's article in *Jour. Cutan. Dis.*, September, 1919, p. 590.)

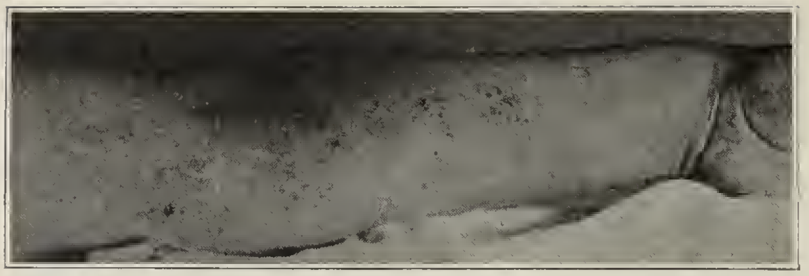

Fig. 14.—Neurodermitis, secondary variety, associated with eczematisation of the skin. Commonly diagnosed eczema. Adult forearm. (From author's article in *Jour. Cutan. Dis.*, September, 1919, p. 590.)

Fig. 12.—Neurodermitis, localized. Cubital area of child, a common area of predilection in children. Note crosshatching of skin, and crust formation from scratching.

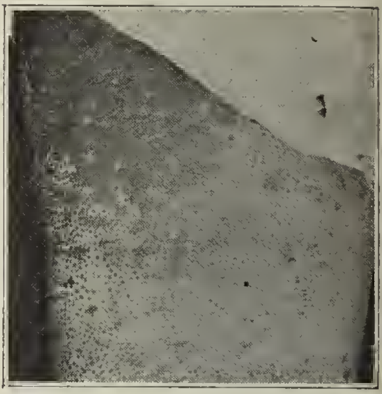

Fig. 13.—Secondary lichenification, following and accompanying eruption of pityriasis ruba pilaris. Inner surface of thigh of adult female, showing typical crosshatching of skin.

New York Academy of Medicine. The patient was a girl aged about five, who presented a sharply defined area of lichenification in the regions above mentioned. The inference was naturally drawn by the members of the section that the eruption was due to some form of irritant coming in contact with the skin, from the seat of the toilet; but careful questioning of the child's parents failed to substantiate this as an etiological factor; when the child was seated it was seen that the margins of the patches did not correspond to the outlines of a toilet seat and that portions of the skin were affected which would not come in contact with a toilet seat or with an ordinary chair. A similar case is at present under my care, in a girl aged fifteen, whom I have had under observation for five years. She is of neurotic habitus, and has neurotic parents. About twice a year, in the past six or seven years, patches of lichenification appear on the lower gluteal and upper femoral regions, without ascertainable external or internal factors to account for them. They are associated with considerable itching. Röntgen ray treatment is only of temporary benefit; the skin will clear up, the itching will stop for several months; then the child again begins to scratch, and a new outbreak occurs, located in almost exactly the same areas as before. The attacks are growing less severe as the child grows older. The third case (see Fig. 2) was observed in private practice, in a boy aged six.

MODE OF PRODUCTION OF CUTANEOUS LESIONS.

(From Brocq.) "At the outset there is absolutely no visible lesion on the part of the integument; gradually the tissues change as the result of scratching; they first lose their normal color and assume a slightly dusky and at the same time, pinkish tint. On close inspection the skin is seen to present a finely granular and mottled appearance. At this stage it is already possible to discern in certain localities, under varying illumination, a sort of flattened, poorly outlined, somewhat glistening, very minute pseudopapule formation. Later on, these lesions become more pronounced, the tissues assuming a dusky red color, or becoming distinctly pigmented; they are roughened or begin to be furrowed by fine criss-cross lines. The dermis gradually thickens, becomes infiltrated and the disease finally assumes a truly pathognomonic appearance.

"Having reached its stationary stage, circumscribed pruritus with lichenification has the general form of a more or less extensive patch of variable dimensions, but having an average diameter of five to fifteen cm. in its greatest axis. Its outline is extremely variable according to the case and the affected region. Although usually of oval shape, it may also be crescentic, semicircular, or irregularly triangular. It may develop on any part of the body surface. These patches may be single in a given subject and always remain single; they may be multiple; very often they are two or three in number. Sometimes they are symmetrical, especially when situated in the flexures. When a patch has reached a quiescent stage, it sometimes presents three somewhat ill defined zones: a somewhat diffuse, pigmented external zone; velvety, or as if composed of fine, very minute papules, varying from light café au lait to light brown color; a middle, papular zone with lesions which are scattered toward the external boundary and confluent toward the internal boundary, being apparently formed by a much more pronounced papillary hypertrophy than that which characterizes the preceding zone; and, thirdly, an internal infiltration zone of more or less uniform appearance, in which area the tissues are hardened, thickened and furrowed by a *rectangular or lozenge-shaped criss-cross design.* (Fig. 3)"

It is chiefly this cross hatching, this formation of pseudopapules, which distinguishes the affection clinically from lichen planus, with its independent, true papules, and from all forms of eczema.

In secondary pruritus with lichenification we have practically the same conditions to deal with, with this important exception: instead of the patch being preceded by pruritus affecting an apparently normal skin, the lichenification is superimposed upon an already diseased skin which itches and which the patient consistently scratches: scabies, eczema, lichen planus. The patient simply presents two different conditions, the lichenification having been superimposed upon the original pruritic dermatosis. As time goes on, the original trouble may even become obliterated by the lichenification, as I have observed in several patients suffering from true lichen planus; these are the rare instances, previously mentioned, in which the differential diagnosis between lichen planus and lichenification might be beset with difficulties. In chronic eczema, lichenification frequently takes place and then the condition is often designated lichenified eczema; the name makes little difference, but in reality it is lichenification in eczema. The same applies to any other pruritis, scratching disease like scabies or pediculosis (Fig. 4). In clinics with large services, hardly a day passes without the incidence of two or three examples of eruptions in which eczema and lichenification exist at the same time, and as the eczematous part of the eruption usually predominates, such cases are almost without exception classed simply under eczema.

In the diffused form of pruritus with lichenification, the appearance of the skin is practically identical with that of the circumscribed variety. The skin is at first dusky red, then becomes brownish and somewhat muddy-looking in color. The peculiar cross hatching may implicate the whole cutaneous surface, or large parts of it. The zoniform arrangement above mentioned and the formation of scattered papules are usually not present in this variety. Traumatic alopecia is a frequent concomitant. Dryness of the affected skin is characteristic, in contradistinction to eczema, which in its earlier stages is a moist disease (Fig. 5). This is a photograph of a young woman with universal lichenification, who for many years had been a victim of asthma and hay fever.

HISTOPATHOLOGY.

The microscopic structure of pruritus with lichenification has been described by Brocq and Jacquet, Darier, Dalous, Marcuse, Tommasoli, Kreibich, Fabry, Vignolo-Lutati, and others (4). More recently, Highman (5) studied a series of slides derived from patients in the dermatological department of the Vanderbilt Clinic; he pointed out the characteristic structural changes, and showed wherein these changes differed from those seen in eczema; among the latter he itemizes: 1, absence of vesicles in the epidermis; 2, absence of marked hyperkeratinization or marked parakeratosis; 3, absence of excessive fat in the epidermis, vessels, skin glands, and so forth; 4, absence of follicular involvement; 5, absence of disturbance of the pilosebaceous or sweat organs.

According to the recently conducted investigations of Arthur Alexander (6), there are three outstanding points in which eczema and pruritus with lichenification differ from each other: 1. In neurodermitis, despite the high grade of edema in the cutis and the epithelium, the stage of vesicle formation is absent, while it constitutes the prominent feature of eczema; in the farthest stage or development of neurodermitis, there may occur a sort of abortive, tiny vesicle formation (network structure), characterized by the formation of sharply circumscribed cell groups; in these, the protoplasm of the rete cells exhibits an intracellular, and a less pronounced intercellular edema, so that a sort of honeycomb appearance is manifested, in the meshes of which are seen wandering cells, fibrinous exudate, and the nuclei of epithelial cells. This network structure shows no tendency toward progressive or regressive alterations. 2. Neurodermitis is characterized, in its papular stage, by a wellmarked displacement or washing away of the pigment of the basal cylindrical celled layer, associated with a certain hyperpigmentation of the epithelium, in the less affected surrounding areas. 3. In neurodermitis there is an invasion of the epithelium of wandering leucocytes emanating from the papillary and subpapillary infiltration, so that the epithelial layer is studded with wandering cells; this invasion of leucocytes is sometimes so pronounced that it gives rise to a breaking up of the interpapillary prolongations of the cutis.

The question whether these three criteria are sufficient to designate neurodermitis as an anatomical entity is left open by Alexander; but he contends that clinically, the disease is an entity, to be sharply differentiated from other dermatoses.

The latest work on the subject is that of Bukovsky (7). He takes pains to express himself as being strongly opposed to the views submitted by Dind (3), and then goes into the details of his own clinical and histological investigations. The gist of his paper is about as follows:

Neurodermitis is a welldefined disease, *sui generis*, to be sharply differentiated from eczema, from lichen planus and from all other dermatoses. The actual macroscopic (visible) changes in the skin may be preceded for a long time, even years, by persistent pruritus. The primary lesion is a rounded, slightly elevated, glazed, smooth, reddish-brown papule, either isolated or occurring in groups, or forming confluent plaques of varying size. There are certain areas of predilection, such as legs, forearms, nape of neck, genital and anal regions.

Based on the mode of grouping of the lesions and on the course of the eruption, the author differentiates three clinical varieties: lichen simplex chronicus circumscriptus of Vidal; pruritus with lichenification; neurodermitis nodularis. The histological changes are identical in these three varieties. There is a papillary and subpapillary edema, sometimes extending into the deepest layers of the epidermis; dilatation of the bloodvessels; a proliferating inflammatory reaction, sharply defined, in the papillary bodies; a perivascular infiltrate in the deeper layers of the corium; a sclerosing of the connective tissue, extending downward from the papillæ; a complete absence of the elastic tissue in the sharply defined nodular infiltrates. The epidermis presents a moderate degree of acanthosis, but no evidences of inflammatory reaction.

Bukovsky believes that even before the appearance of macroscopic lesions on the skin, a toxic substance in the blood acts upon the peripheral nerve-terminals, causing the pruritus, the dilatation of the vascular elements, and the edema; in his opinion, neurodermitis is a condition arising from internal disturbances.

Lastly, my own observations, based on the study of numerous examples of eczema, lichen planus, and neurodermitis, and supported by the examination of microscopic sections, from which comparisons and deductions can be made scientifically, have tended strongly to confirm the views expressed in the foregoing, namely: 1, neurodermitis is a disease *sui generis;* 2, it possesses peculiar clinical and histological characteristics; 3, it is confused with eczema and occasionally with lichen planus; 4, it should be classed under a separate heading.

TREATMENT.

The treatment must be directed toward constitutional disturbances and toward the eruption itself. As stated, a certain proportion of patients are apparently in good health, while others are afflicted with various forms of so-called nervousness, insomnia, irritability, and so forth. My personal observations have demonstrated the fact that a goodly proportion of these patients have asthma, hay fever or bronchitis; some patients who are apparently otherwise in good health, give histories of respiratory diseases in the parents. Ehrmann (8) believes the dermatosis to be due to gastrointestinal disturbances and faulty endocrinous metabolism. He thinks that a relationship exists between faulty action of the pancreas and certain forms of neurodermitis. He differentiates two groups: The first embraces cases associated with gastrointestinal troubles or motor and secretory nature (anacidity, hyperacidity, faulty pancreatic digestion, atony of the stomach, intestinal catarrh, and so forth). The second group embraces the cases associated with disturbances of internal secretions.

The only internal remedy which I have found useful in a certain proportion of patients, is arsenic, given preferably by subcutaneous injection. Occasionally, aspirin may be found beneficial, to aid in the relief of itching. Patients with hyperthyroidism, seen chiefly in young girls, must of course receive adequate treatment for their constitutional as well as their cutaneous troubles.

The local therapy may be divided into medicinal local treatment; quartz light and x ray treatment.

The first thing to do is to direct one's efforts toward the cessation of itching; when the patient stops scratching, the disease tends to heal spontaneously. One of the best remedies is the following:

Calaminæ præp.	ounce 1
Pulv. zinci oxidi	ounces one and a half
Liq. carbonic deterg.	ounces 2
Phenolis	drams 2
Mentholis	grains 5
Glycerini	drams 2
Aquæ calcis	ounces 3
Aquæ rosea q. s. ad	ounces 8

Shake well. To be painted on with a camel hair brush, every three or four hours.

When the itching has abated and the inflammatory symptoms show a tendency to subside, the use of the lotion may be stopped and this ointment is applied:

℞

Naftalan	dram one
Phenol	dram one half
Menthol	grains three
Lanolin	ounce one
Vaselin, āā ad	

M. and f. ungt. S. Apply by gentle massage, morning and night.

These remedies will do well for mild cases, in which there is not a great amount of infiltration. In thickened and sclerotic patches, the best remedy is:

℞

Chrysarobin	grains ten
Phenol	dram one half
Menthol	grains three
Ungt. zinci oxidi., ad	ounce one

M. and f. ungt. S. Rub in gently morning and evening, using a rubber finger cot. *Caution.* Avoid contact of salve with eyelids.

It is advisable to place bandages over areas treated with chrysarobin ointment, to prevent accidental contact of the remedy with eyes. In cases associated with considerable scaling, salicylic acid in four per cent. strength should be added to this ointment.

In a certain proportion of patients, the local treatment as above outlined renders only temporary and shortlived relief. In these, the calamine compound lotion may be safely resumed for the immediate relief of the itching, and quartz light therapy may be instituted. An erythema dose, a sharp inflammatory reaction, should be administered at intervals of seven to ten days. The light is applied after the skin has been cleansed with a little oil or cold cream, then washed with dilute alcohol. The light often helps when medicinal remedies fail.

The best and most lasting benefits are obtained from x ray therapy. If strong preparations of tar, chrysarobin, mercury, sulphur, iodine, and so forth, have recently been applied to the areas to be treated, the x ray treatment must be held in abeyance until all evidences of a medicinal dermatitis have vanished —anywhere from two to four weeks. In the meantime, a half strength calamine compound lotion may be employed with benefit. The superimposed dermatitis having subsided, the x rays are applied either in one quarter Holzknecht unit doses, unfiltered, once a week, or in one half unit doses once in two weeks, these doses being computed at skin distance (9).

Although x ray treatment is indisputably the most efficacious remedy, it does not always, unfortunately, prevent recurrences in certain obstinate cases, although it probably induces longer periods of relief than the other remedies at our disposal.

For the accompanying illustrations I beg to acknowledge my thanks to the Dermatological Department of the Vanderbilt Clinic.

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24 WEST FIFTY-NINTH STREET.

Historical Medicine

The Influence of Disease on History

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The tragic death of President Harding, stricken as his predecessor, while pleading for more active intervention by this country in international affairs, only serves to emphasize once more by what a slight thread hang such vast human ventures as a nation's policy, the outcome of a war and even the world's future. The most learned, although by no means the most entertaining, of Gibbon's successors liked to dwell on the fact that no less than twenty-five times had the course of history been diverted in the nineteenth century by actual or attempted crime. Morley, who prided himself on his knowledge of famous events, apparently considered this number far too large. And yet, it should not have been too hard for Rousseau's biographer to recall that somber list written with dagger, gun, and bomb in his own times: Kleber (1); Paul I (2); Cadoudal (3); Staps (4); Kara George (5); Kotzebue (6); Duke of Berry (7); Sucre (8); Miloradov (9); Constantinople bishops (10); Capo d'Istria (11); Fieschi (12); Rossi (13); Orsini (14); Richardson (15); Lincoln (16); Berezowski (17); Pierre Noir (18); Prim (19); Nobiling (20); Abdul Azis (21); Alexander II (22); Phenix Park (23); Garfield (24); Stambuloff (25); Czarevitch (26); Carnot (27); Cánovas (28); German missionaries (29). This does not take into consideration murders such as those of Ali Pasha; attempts on women rulers (Victoria, Isabel, Elizabeth); Latin American executions (Monteverde, Garcia Moreno, Heureaux); legalized murders (Enghein, Toussaint-Louverture, Hofer, Palm, Ney, Maximilian, Rizal); plots and revolts (the one against Alexander is said to have shortened his life); massacres (May 2, Chio, December 11, Armenia); duels (Hamilton-Burr, Carrel-Girardin, Montpensier-Bourbon), self-murders (Castlereagh, Boulanger, Balmaceda, Archduke Rudolph), and leaves practically untouched the fertile Eastern field. While the historical importance of these crimes may vary, who can deny their bearing on human evolution?

For those who saw the start of the World War, there is no question as to the curious twists given by assassination to history. In fact, advocates of its usefulness have never lacked through the centuries. The greatest of Latin philosophers did not hesitate to add a few sentences to his treatise on old age (or was it the one on friendship?) to justify and doing away of his patron, Cæsar, and a famous priest, Father Mariana, was not at loss for reasons to excuse regicide. Talleyrand cynically could not understand such a despotism as Russia's, unless tempered by murder.

But deep as are the effects of crime there is another factor just as powerful, but more neglected —disease. American Presidents have been struck down even more times by physical ailments than by murder. We may just cast a passing glance at the deepseated, protracted consequences visited on a whole nation by endemics, such as ankylostomiasis on China and Egypt, and malaria on "the glory that was Greece and the grandeur that was Rome." Though more continuous, its effects are fairly similar to the murder on a large scale, called war. We may also overlook the pestilences which drove whole nations to seek a new home elsewhere, such as took to Italy, the Etruscans, the old masters and rivals of Rome, and probably lurked behind the first onrushes of the Barbarians which finally crumbled into dust the Cæsars's vast empire.

Epidemics which affect contending armies nearly the same can hardly be deemed factors in the outcome. Even in the 1812 campaign, that bugaboo so often used by sanitarians, the Russians lost nearly as many men as the French from disease, at least in the early stages. (The Czar's own brother in law died from typhus fever.) There is no use either in turning to such outbreaks as spared neither friend nor foe. The evenness of the punishment impeded the tilting of the scales. The Trojan War was thus prolonged through the epidemics in both camps. Rome was also ravaged in practically every decade of its stormy existence. In one of these periodical scourges, the Sybilline books advised bringing from Epidaurus the serpent, symbol of Æsculapius. In other cases, however, we may see a battle, a campaign, and even a war or a nation's fate, decided by one of those tidal waves of sickness, called epidemics. One of the causes to which the Romans attributed their decay was the fact that diseases propagated more easily in the climate of sunny Italy than amidst the ice and snow of the North, whence the numberless Barbarian hordes emerged. We all know that a plague was chosen by God Himself as one of His instruments to afflict the Pharaoh into releasing the Chosen People. It is true that they had not been long out of Egypt when their indulgence caused another visitation which carried off not less than twenty-four thousand of Moses's followers. Let us turn instead to more dramatic instances.

In the most critical hour of the French Revolution, there is one man alone who seems strong enough to bar the angry waves of revolution and anarchy. Yet that man, Mirabeau, still in the prime of life, is snatched off just when most needed, by diaphragmatitis, or perhaps by too much enjoyment of life. Italy, said Gladstone, might have been different, had not a premature death claimed Cavour and Ricasoli at the hour of her greatest need. Had Henry V not gone to an early grave the crowns of France and England would in all likelihood united on his head and the War of the Roses died unborn. How strange would American history perhaps read, had gout not darkened Chatham's mind and thus destroyed his influence in

George III's councils! How diverse would events have turned should any physician been able to find a specific to cure Timur's game leg; Juana and Charles VI's voluptuousness; Mary Stuart, Isobel and Maria Luisa's flightiness, Charles V and Philip II's gout. Take feeblemindedness off Charles II and the bloody Spanish Succession War would never have broken out. In fact, the same end might have been attained by preventing the disease which snatched away the Electoral Prince of Bavaria's infant son. Had not James II died at that very moment, England would have kept out of the war and Austria, unsupported, would have also remained quiet. And finally, had not the Austrian Emperor died and his brother Charles ascended the throne, the conflict would undoubtedly have lasted longer.

What a different world this might have been if consumption had not snatched the elder brother of the last Russian Czar; cancer not killed prematurely the father of the last German Kaiser, and death not claimed before their allotted time the father and the elder brother of the present British King. Former Prime Minister Asquith has not hesitated to place on record his conviction that the unexpected death (appendicitis) of Baron Marschall von Bieberstein was an international calamity, as, had he lived, the World War probably would not have taken place. Historians may do worse than dwell upon those paralytic attacks which, after disabling an American President at a tragic hour for mankind, shortly afterwards crippled the greatest Russian ruler since Peter I. Another man would now be at the White House had not a thrombus put a sudden quietus on Roosevelt's intense life.

Josephine's barrenness drove Napoleon into the arms of an Austrian Archduchess, as he said himself, to blind him to his danger. Had there been a way to cure Henry IV's impotence, the greatest of Spanish rulers, the Catholic Kings would never have ascended the throne, and Columbus might never have found a sovereign to send him on his quest of a new world. Discard Loyola's lameness and the great company which fought Protestantism to a standstill would never have come into being and the Reformation might have swept on beyond the Pyrenees and the Alps.

Probably the most dramatic events in 1922 were Lloyd George's downfall and the sudden recovery of Turkey. All this can be traced to an attack of rabies caused by a mad monkey. After having increased practically threefold the size of his country, Venizelos, the greatest Greek statesman since Pericles's days, was suddenly thrown out of power when his master, Alexander, was bitten by his pet and finally died. Constantine, recalled to power, courting popularity and English favor, embarked on his costly Eastern adventure. The Turk turned and the Greek defeat was followed by the ousting of Constantine. Then Lloyd George, who had backed Hellenic ambition, was forced to show his hand. The Turk would not be bluffed, England was averse to fighting, and the last survivor of the "Big Four" went down ignominiously.

Go back to one of the most meaning hours for humanity. Greece, united, had saved the world for Hellenism. But in the hour of victory the forces broke apart and the two great Greek states, embodying opposite ideals, Athens and Sparta, clashed. Athens, headed by one of the greatest statesmen of all times, Pericles, seemed likely to come atop. Then the plague, so masterfully described by Thucydides and Plutarch, entered the lists. More than half the Athenians died, including the illustrious chief himself. Sparta conquered. The Athenian, from a doer in the field and on the waves, became a thinker. No more Parthenons were built, no more Salamis were won, but Plato lectured at the Academy and Aristotle taught at the Paripatos.

Alexander, the nearest approach to a demigod this earth of ours has ever seen, while looking about for new worlds to conquer, was perfecting his idea of blending two civilizations, East and West, the twins of Father Time. His genius, the wild impulses of youth subdued, seemed to promise mellow years of peaceful progress. Yet at that very moment, the swordsman of Greek culture was stricken with a fever bred in the marshes of Babylon. Philip's son died in old Hammurabi's place, when he was thirty-three years old. His generals, as the bard put it, mere subjects with Alexander alive, but kings with Alexander dead, fought for his legacy, and the Macedonian's dream of a united world was drowned in tears and blood.

Rome faces her greatest danger. Hannibal, after destroying her armies, is knocking at the doors. Yet there is Capua on the way and the insidious fevers of the Roman Campagna. When the time comes again to strike, the Carthaginian host, ravaged by malaria, are unequal to the task. A few centuries afterwards, the mistress of the world is once more threatened. Attila is headed towards the Tiber. As the blow is about to fall, a hemorrhage carries off the Barbarian on his wedding night, and Romulus's town is saved. Mohammed's genius has reached its meridian. From his far Arabian corner, militant apostles are sent afield, Koran in one hand and sword in the other. Vast plans are forming in his agile mind when a malignant fever rushes the Prophet away in ten days to his paradise. The Normans were able to secure a hold in France because the last of the Carlovingians, Charles the Fat, was an epileptic, unfit for active work, who wanted to be left alone to the exquisite torture of his migraine.

Let us recall one of the world's epochmaking crises. Pope and Emperor were engaged in their death tussle as to whether the sword or the miter shall prevail. One of the most powerful of German sovereigns decided to make short shrift of the question. Barbarossa collected an army, crossed the Alps and stormed Rome. In the hot Italian summer, sunstroke and typhoid decimated his troops—his losses in one week were placed at twenty-five thousand—and he failed ignominiously. Ten years later, when he decided to retrieve his luck, it was too late. The start of the quarrel between the ablest of his successors and the Papacy may be traced to Frederick II's sudden illness just before his departure for the Holy Land. Gregory IX claimed that the indisposition was feigned by the

Emperor so as not to lead the crusade. Towards the last of the moving drama, dysentery gave the victory to the Holy Father by snatching Frederick while still in the field. The popes, at the last, were able to get the supremacy only through the untimely death of Henry III in Hildebrand's time and Henry VI in Innocence III's. The Crusades, by the way, failed as much through the frightful losses caused by epidemics as through the dissensions of the Crusaders themselves, and their last great leader, St. Louis, died from dysentery in Tunis. When Robert Guiscard was planning to substitute a martial Norman dynasty for the effeminate Constantinople rulers, an epidemic blasted his hopes in the island of Cephalonia, as another epidemic had blasted them a few years before, in front of Durazzo.

In 1494 Charles VIII conquered Naples, landing what looked like a body blow in the century old rivalry between France and Spain for Italy. But a new enemy had just put on his gaudy armor. About this time, a Genoese adventurer had plunged through unknown seas and, in the poet's words, "pulled a new world out of the deep." With it, however, another novelty had also come, syphilis. Quite unwistfully, the Spaniards had taken this ally into Naples. The disease proved the French's worst foe. Not a year had elapsed from Charles's triumphal arrival when he was back, as a fugitive, at the Alps. Hard as the French kings tried afterwards, Italy remained a Spanish possession for over two centuries.

One of the masterpieces of politics and literature, in fact, the mirror of an age, is Machiavelli's *Prince.* Its prototype had been one of the mot unscrupulous and capable politicians of the times, Cesare Borgia. With all his talents, he failed, in sight of the goal, because of an ill timed complaint. For years, Cesare had been laying quietly his plans to drive the foreigners from Italy, and build himself a kingdom. All, however, pivoted on the support of the Holy See. Cesare had therefore made elaborate arrangements to elect a pope of his own choice when his father died. At Alexander's death, it so happened that the son had just been taken sick with dysentery—poison, said some—and the helpless invalid had to strike a poor bargain with his worst enemy, Cardinal della Rovere, presently Julius II.

Do you want to know when and how the problem of Alsace-Lorraine, which ultimately was to flood Europe with blood, really started? The three famous bishoprics, Metz, Toul and Verdun, had always belonged to the German Empire. About 1552, when Charles V was looking in another direction, Henry II took possession of the three. The Emperor tried to regain his own and besieged Metz, the maiden stronghold. One of the bravest of French generals, Guise, threw himself into the fortress and took charge of the defense. Charles might have succeeded, but for typhoid thinning his ranks. At last, he gave up, uttering his famous words as to fortune being alike to a beautiful wench, fond of youth and turning her back on the aged. His failure began a never ending conflict between two proud nations. The siege was memorable in another respect. Charles had no surgeons with him, but Guise had been wiser. Inside the town was the greatest surgeon of his epoch, Ambroise Paré, and the magnanimous chieftain advised him to care for the soldiers left behind by Charles. This was probably the first instance on record—if we except Saladin—of such a generosity towards an adversary. Yet the Red Cross was still four centuries away.

References have never lacked to the Black Death of the fourteenth century, the "terrible plague like fire" of Bocaccio's narrative, which swept the Old World from one end to another. Petrarch thought posterity would be loath to believe there was once a time when the globe was nearly unpeopled, the homes without families, the towns without citizens and the countryside without farmers. Europe and Asia lost probably twenty-five millions apiece, about one half of their population. This visitation really planted the seeds of the Reformation, as in its wake came the Flagellants with their hatred of the clergy, their attacks on dogma and their contempt for the established Church. To the same epidemic may be partly ascribed the modern persecution of the Jews. The Crusades had already started the work, but the Flagellants poured new oil on the flames, blaming the disease on well pollution by the exiles from Palestine. To the Black Death is also to be traced the Peasant War which became so menacing in England in Richard II's time.

One of the things that imperilled the success of the Reformation was the fact that Emperor Maximilian succumbed unexpectedly to an attack brought on by his rage at a tavernkeeper's dunning, thus permitting a far more powerful and religious prince, Charles V, to ascend the throne. The bloody Thirty Years' War probably owed its immediate inception to the emperor at the time, Rodolph, being afflicted with insanity. The king of Spain, for a fact, joined in the fray because he was recovering from a nearly fatal illness and feared the fires of hell, should he allow the Protestants to conquer. In the same war, Tortensen, the Swedish marshal, could have taken Vienna, and maybe put an end to the contest, had not plague made enormous inroads into his forces.

Frederick II of Prussia was on his last legs, surrounded by victorious French, Austrian and Russian armies. A colic, caused by a surfeit of brandied cherries, changed the outlook overnight. Frederick's bitter enemy, Czarina Elizabeth, was no more. The "three women's" coalition came to an end. The Prussian ruler could hold his own against Marie Therese's demoralized troops and Louis XV's or rather Pompadour's carefree generals. When Austrians and Russians had the Turk practically at their mercy in 1789, a severe outbreak of plague compelled Austria to sign a disadvantageous peace treaty, instead of cutting short the Sick Man's case.

For the first time in her existence, England seems afraid in the latter part of the sixteenth century. Through Dutch merchants and British privateers, news filters of a mighty fleet assembled by Philip. In the Low Countries, gallant Farnesio gets ready his army. The first seaman of the century, Don Alvaro de Bazán, Marquis of Santa Cruz, dies unexpectedly, fresh from his conquest of Portugal, just after writing that he still felt strong enough to subdue other kingdoms for his master. The command of the Armada fell into the incompetent hands of a landsman, the poor duke of Medinasidonia, and alas! the Invincible was all but that.

One reason why all Spanish settlements developed at first so poorly in America was the overhovering menace of disease. Such was the toll exacted that of the two hundred men who sailed with Megalhaes around the world, only eighteen returned. A number of them, though, including their bold leader, were killed in battle with the Filipinos. A mortality of forty and fifty per cent. among the crew and passengers was nothing strange in crossing the ocean. Epidemics also played havoc with the first English settlements in this country and delayed fully fifty years the development of selfsupporting colonies. In fact, who knows that America had to be rediscovered precisely because of disease? When Columbus visited Scandinavia in 1477, not only had all memory been lost of Leif's Western colonies, but nothing had been heard for years of the Greenland settlers. The Black Death had just carried off half the population of Norway, and there was a surmise the same fate might have attained all the Greenlanders. The last Spanish colonies were also chiefly lost through disease. Spain poured troops into Cuba without ever getting within reach of her goal. No sooner were they landed than the yellow jack prostrated them. The fatalities caused by the mosquito have been computed at not less than one hundred thousand from 1854 to 1898. There is much point to General Wood's phrase that the eradication of yellow fever alone justified the Spanish-American War. Tropical scourges likewise kept Lesseps from completing the first interoceanic canal. This, in a way, was rather lucky, as the Panama passageway in the hands of France would have brought sooner or later a clash with the United States, the one nation really capable of holding in her strong grasp the keys of the two oceans.

Take the greatest of all past wars—the Napoleonic cycle. Some future St. Simon will some day elucidate how much of Napoleon's success was due to the fact that at the very moment he picked the crown from the gutter, every other European throne was filled by either an insane or a feebleminded ruler. During his whole career disease was going to make its influence curiously felt. Hoche, the one man who could block his way, died suddenly. At a critical moment, the enemy was beaten at Dresden. The victory had to be pushed at all costs, as everything hinged on the result. Napoleon was taken sick with cramps, first blamed on poisoning. The pursuit lagged, the Allies reorganized and Austria joined the coalition which defeated him completely at Leipzig. At Waterloo, victory seemed again within his grasp. Yet a peculiar ailment slowed his movements. The old lightning strokes were no more in evidence. The triumph at Ligny was not completed; the battle at Mt. Saint Jean did not begin until 11 o'clock a. m., thus giving Blucher a chance to arrive. Back in Paris, the same indecision characterized the emperor's actions. He was ill, really ill, as his sufferings at St. Helena were soon to prove.

The great captain could well laugh at the English expedition to Walcheren, where "fever will dispose of them." And yet he was blinded to the fact that in his two greatest enterprises, the Spanish War and the Russian Campaign, disease turned the tables on him. In Spain, it has been figured out that while he was deprived of about ninety thousand men by wounds, his losses from disease amounted to three or four hundred thousand. Imagine what that would have meant in the 1814 days so gloomily portrayed by Meissonier. Against that undertow, what booted the tireless efforts of "the most virtuous man that ever lived," Larrey? Much has been made of the vast casualties in the Moscow retreat, forgetting that more soldiers fell prey to dysentery and typhus fever than to the bullets. The imperial eagle, so frightfully singed at Moscow and badly frozen at the Beresina, was actually eaten alive by lice on its flight through the plains of Poland and Germany. One of the arguments advanced by Alexander to convince Napoleon that Russia should have Constantinople—one of the points on which their alliance broke—was the constant introduction of plague into his southern provinces from Turkey. In fact, what turned the Muscovite peasants against the French were the epidemics both in Southern Russia and Courland and Livonia—the latter really imported by prisoners in 1807—which were regarded as a divine punishment for the French alliance. On the other hand, Napier in his *History of the Peninsular War* did not hesitate to express his conviction that, at the battle of Victoria which sealed Napoleon's fate in Spain, success had been due to the physicians' efforts, putting five thousand sick veterans on their feet. This full corps added to Wellington's army had saved the day. Napoleon, by the way, always believed that Fox's untimely death had been one of the worst misfortunes of his career, as it had prevented France and England from coming to an agreement.

Half a century afterwards, Bonaparte's successor and namesake was also going to lose a decisive battle, prostrated also by a physical disability, stone in his case. His case led Zola to comment ironically whether a few drops of sand in a person's body were the factor that determined an empire's fate. Daudet has described vividly in his *Nabob* the death of the strong man of the period, Morny, which the author blames on poisoning, although it was most likely due to exhaustion caused by pleasure and high living. To Morny's premature death many traced the downfall of the imperial regime, as his influence might have counterbalanced the Empress' and prevented the Franco-Prussian War. A few years afterward, the new born republic breathed anxiously. Her former ruler was reputed to be again trying his skill on horseback. The imperialists boasted openly of the impending coup d'état, and their fearless mouthpiece, Paul de Chassagnac, shouted in parliament their hopes of seeing their master chase *"ces gens par la fenêtre."* Disease was, however, stalking his prey. The old trouble recurred, Napoleon had to be operated upon and he did not survive. The republic was safe. In the Crimean War the mortality from disease largely influenced the same ruler into signing an early peace—although perhaps not so much as the fact that he had already secured all the aims that led him into that useless venture. Mills regretted that Orsini's bombs had missed their mark, as the Franco-Prussian War would then have been avoided. And yet, eliminate tuberculosis from the King of Rome's system, and Napoleon III would have never been heard of. Had Albert's physician not blundered and the Prince Consort been spared by typhoid, perhaps his prestige might have been sufficient to stop that most avoidable of wars. Practically his last act had been to veto a message that might have brought war between his adopted country and the United States.

In turning the pages of history, who can ignore the significance of those attacks which at telling times took in Rome, Sulla out of Cæsar's path, Germanicus and Drusus out of Nero's; in England, the Black Prince out of Henry V's, Henry V out of Warwick's, Henry VII's elder son out of Henry VIII's, Edward VI and Mary out of Elizabeth's, Pym and Hampden out of Cromwell's, Cromwell out of Charles II's, Prince Frederick out of George III's, the four sons of George III and their issue out of Victoria's, Pelham out of Chatham's, Canning out of Peel's, Bentinck out of Disraeli's, Sydney Herbert out of Gladstone's, Campbell-Bannerman out of Asquith and Lloyd George's, and finally, Bonar Law out of Baldwin's; in France, Carloman out of Charlemagne's, Charles VIII out of Louis XII's and Francis I's, Henry II's sons out of Henry IV's, Louis XIV's son and grandsons out of Louis XV's, Louis XV's son out of Louis XVI's, Mirabeau out of Danton's and Robespierre's, Hoche out of Napoleon's, the King of Rome out of Napoleon III's, and Gambetta out of Clemenceau's; in Spain, Ferdinand and Isabella's son out of Charles V's path, Charles II out of Philip V's, Ferdinand VI out of Charles III's and in Germany, to go no further, Frederick William out of Bismarck's way, and Wilhelm I's son out of the last Kaiser's way.

Let this cursory sketch that barely grazes a fertile ground show the transcendent influence on history of a factor seldom studied and usually neglected—disease. Finally, let us not forget the curious paradox that all modern sanitary work, that wonderful fabric of health insurance, disease prevention, child welfare, infant hygiene, hospital care, increased expectancy of life, prophylactic vaccination, nursing service, early diagnosis, tuberculosis sanatoria, that has redeemed the tropics for the white race, lengthened the span of human life, and deprived many diseases of their terrors, had their origin in those early onsets of cholera, plague, yellow fever, and typhus fever, which led to the appointment of boards of health and promoted the enactment of sanitary legislation.

NOTES.

1. Permitted English to conquer Egypt.
2. Turned Russia from Napoleon's into his enemies' camp.
3. Decided Enghien's shooting, and as a protest, a European coalition.
4. Strengthened German resistance to Napoleon.
5. Divided Serbia into armed camps.
6. Put new life into the Holy Alliance.
7. Ultimately caused the 1830 revolution.
8. Ended Bolivar's influence in South America.
9. Infuriated the Greeks and eventually led to Russian intervention.
10. Converted Greece from a republic into a monarchy.
11. Confirmed the repressive policy which finally caused Louis Philippe's dethronement.
12. Stopped Pius IX's liberal policy.
13. Led Napoleon III to interfere in Italy and nearly brought a clash with England.
14. Bombardment of Japanese ports by the British and reversal of anti-foreign policy.
15. Alienated the South for a whole generation.
16. Confirmed Alexander II in his distrust of France.
17. Discredited the Second Empire and paved the way for the revolution.
18. Settled the fate of Amadeus' rule.
19. Gave Bismarck a chance to enforce his anti-socialist laws.
20. Placed ultimately Abdul Hamid on the throne.
21. Committed Russia to a reactionary policy.
22. Delayed Irish selfgovernment.
23. Brought eventually the democrats into power.
24. Changed Bulgaria from pro-Russian into pro-Austrian.
25. Made Nicholas II a confirmed anti-Japanese.
26. Permitted the Dreyfus affair.
27. Eventually permitted the Spanish-American war.
28. Allowed Germany to seize Kiauchau.

Taoist Ideas of Human Anatomy.—E. V. Cowdry, Ph. D. (*Annals of Medical History*, December, 1921), who is connected with the anatomical laboratory of the Peking Union Medical College, begins his article with an interesting account of the numerous difficulties encountered before access could be gained to the sacred precincts of the most complete and secret library of Taoist medical and literary works, situated about half a mile outside one of the gates of Peking. He describes also the fine old priest in charge, to whom they presented a photograph of himself, which delighted him immensely because it showed the sunshine reflected brightly from his shiny black silk hat. This brightness he declared to be the flame of his own intellect, which no one before had ever succeeded in photographing.

The central idea of Taoism, greatly preverted as it has been from the original teachings, is demonism. Great attention is paid to animals. In fact, one of the great temples is an asylum for old and decrepit pigs and certain kinds of birds, which are maintained in luxury till they die. Each of the six organs of the human body is thought to be inhabited by an animal, as is represented in one of the books in the library. A white tiger lives in the lungs, a turtle and a serpent in the gallbladder, a dragon in the liver, a phœnix in the spleen, a red bird in the heart, and a two headed deer in the kidneys. The *Nan Ching,* written by Li Chung in 1269, is probably the most valuable book in the collection. It contains diagrams of the viscera, shown anteriorly and posteriorly. In these drawings, curiously, everything is transposed, the liver being shown on the left, and the spleen on the right. Another drawing illustrates the close and elaborate relationship of spirits and genii to the human body; another shows where the pulse should be felt at the twenty-four different times of the year—in summer near the fingers, and in winter far up the arm. One design traces differences in temperature in the various parts of the body. At the head is shown a broken line between two solid lines, which means fire, and at the feet, a solid line between two broken ones, which means water. Going up toward the head the temperature increases, the reason why clothing is not needed to protect the head from cold. The other signs in the drawing indicate combinations of male and female principles. The pure male principle, three solid lines, stands also for Heaven; the female principle, three broken lines, represents earth. Proper combination of these principles is essential for life and happiness. In disease, the malicious excess of one or the other principle is removed by inserting needles of great variety into the body in definite localities. Teachings such as these prevail throughout China in many localities, although the numerous religious beliefs of the country have altered some of the older practices in certain regions.

Editorial Articles

THE PENETRATION OF THE ORGANISM BY NEMATOIDEA THROUGH THE INTEGUMENT

For years past and until some two decades ago, it was generally admitted that parasites of the worm class entered the human organism by the natural orifices, especially the mouth. However, such is not always the case, because it has been shown that several intestinal parasites reach their abode through the cutaneous surface.

Thus, in 1898, Looss demonstrated this process with the larva of ankylostoma, although he made this discovery upon his own person and somewhat by chance. The reality of this route by direct penetration has since been confirmed by numerous observers. Looss also showed that this manner of penetration is likewise true for Strongyloides stercoralis and at a later date Gornez de Faria, Feitosa and Smith demonstrated penetration of the skin by Necator americanus. A similar demonstration has been made in the case of stephanurus.

Brumpt, of Paris, has recently shown that certain tissues attract the larvæ of some nomatodes and allow them to make a transit through them. This fact has already been proved in the case of the parasites mentioned above, but only in the case of monoxenous parasites. Nevertheless, this likewise applies to other parasites which undergo their evolution in an intermediary host and still follow the cutaneous route for entering the organism. Among them Filaria bancrofti may be mentioned. The larvæ of this parasite are transmitted by various mosquitos, but they are not inoculated by the bite of the insect as is, for example, the plasmodium of paludism. They are merely placed upon the surface of the skin by the bite of a contaminated mosquito usually by rupture of the labium or sheath of the proboscis. Thus placed in contact with the skin, the larvae of the filaria actively penetrate through the integument and it is probable that the larvae of Filaria loa do the same, while it has been proved in the case of Dirofilaria immitis, which is a parasite of the dog.

The passage of larvæ—no matter which—through the skin is not effected without setting up local reaction, such as dermatoses resembling attacks of urticaria, with redness and itching and occasionally papulovesicular or pustuloulcerating eruptions, the latter being due to secondary infection. The cutaneous manifestations arising from the penetration of the larvæ of ankylostoma and necator are especially encountered in warm damp climates in subjects who walk and work with naked feet.

Finally there is one point to which Brumpt calls particular attention and that is that these human vermin dermatoses may also be due to adult nomatodes of various animals. These are capable of producing cutaneous lesions in man and inversely, the larvæ of nomatodes—parasites of man—may cause cutaneous lesions in animals but in their ordinary host they never attain full development.

THE ETIOLOGY OF CUTANEOUS PIGMENTATION

The pathogenesis and etiology of cutaneous pigmentation is unquestionably interesting but not well known and the divers notions we possess are, to say the least, very hypothetical. The appearance of dyschromias appears to be related to external and internal causes, the former being the varieties best understood. It is known that any irritation, when somewhat intense and prolonged, can give rise to pigmentation of the skin but as Darier has pointed out these pigmentary disturbances have, for the most part, the character of vital reaction against an irritant and, consequently, their manifestations and intensity will depend less often on the nature of the causal agent than on the reactionary tendency of the subject.

Among the irritating causes, physical agents play an important part. For example, the production of sunburn is principally due to light and in particular to the chemical rays of the spectrum. Heat may be the factor in some cases and Neisser incriminates the caloric action of furnaces in cases of syphilitic dyschromia, occurring in blacksmiths and bakers. In the same way, mechanical agents can give rise to pigmentation, or at least, play a secondary part as a localizing agent. Vitiligo and the socalled primary pigmentary syphilide are very frequently localized in areas chronically irritated, as has been shown by Thibierge and Finger.

Finally, to conclude with the external causes, besides the parasitic dyschromias, whose etiology seems to be complex, it may be complex, it may seem logical to include those which are secondary to the dermatoses such as the bullæ of pemphigus, herpes, zona, boils, papulonecrotic tuberculides, etc., as well as syphilitic lesions. The macula of roseola, secondary papules and ulcerating lesions are the starting points of pigmentary change in which either a melanoderma or a more or less atrophic leucoderma are observed.

But still other causes of dyschromia have been involved both general and internal, whose mechanism has been very diversely interpreted. Among them hyperemia should be first mentioned as it unquestionably intervenes in pigmentations having a local or external cause, as, for example, the melanoderma occurring on varicose limbs. Lesions of the suprarenal capsules have for some time been recognized as a cause of melanoderma of Addison's disease but space forbids a discussion as to what extent renal insufficiency or lesions of the pericapsular nervous plexus acts as factors. If suprarenal insufficiency be incriminated it should be pointed out that normally the suprarenals destroy pigment or a pigmentogenous substance and that when diseased, they cannot do so. Or if the sympathetic theory be maintained, it will be said that when irritated, a hyperactivity of ing from the Spirocheta pallida.

The sympathetic and cerebrospinal systems undoubtedly play a part in many dyschromias, as in leprosy, vitiligo and the socalled primary pigmentation of syphilis. The latter does not belong exclusively to lues because it has been observed in tuberculosis and chlorosis. On the other hand, in many ways it is similar to chloasma of pregnancy and Addison's disease and it may well be asked if the syphilitic dyscromia is not also consequent upon some disturbance of the pericapsular nerves resulting from the spirocheta pallida.

Other dyschromias have been regarded as due to hematic changes, such as malarial melanoderma and perhaps bronze diabetes. According to Diday, the blood of syphilitics undergoes a peculiar change in its coloring matter which allows it to become deposited in the tissues. If for any reason a congestion arises with a consequent increase of the blood in the skin, it will progressively infiltrate the integuments and finally the coloring matter will come near enough to the surface to produce a perceptible change in the hue. Petresco likens the mechanism of the pigmentary syphilide to that observed in paludism; there is an exaggerated deposit of hemoglobin coming from the destroyed red blood corpuscle, hence melanin and its deposit in the tissues. Other observers have thought that the presence of bile pigments in the blood might be the origin of a good number of dyschromias and perhaps syphilis, which does not spare the liver, produces pigments in this way. Finally certain disturbances of pigmentation have a toxic origin, such as arsenical melanoderma and argyria.

Although the etiology of dyschromia is poorly understood, the process can be divided into primary and secondary types. The first—or spontaneous type—is not preceded by any eruptive element. On the contrary, secondary pigmentations are those succeeding an eruptive element which was seated at the spot where the dyschromia—melanoderma or achroma according to the case—ultimately arises. In the first group can be placed the melanoderma of Addison's disease, lentigo and chloasma of pregnancy. In the group of secondary dyschromas are the melanodermas or achromas following some local dermatosis, such a pemphigus, lichen planus, varicose ulcer, etc.

HISTORICAL THOUGHT IN SCIENCE

On another page Dr. Moll has made a very suggestive contribution to historical thought in science by upholding the thesis that representative men, as Emerson calls them, have altered the course of history. He falls in line with a school of historians who have frequently, though incidentally and in rather desultory fashion, given their adhesion explicitly to the same doctrine. It is to be doubted, however, if they are the most numerous or will represent the general trend of modern thought on the subject. It is difficult to deny, of course, that if Napoleon had died on the bridge of Lodi the civil jurisprudence of France and its admirable cohesiveness would not have been what it is today. It is less difficult to assert the evanescence of his conquests, bought at the expense of such a squandering of blood and treasure as sinks into insignificance only in the events of a hundred years later. He left his glories for his countrymen to gloat over, of course, but he did not give birth to the Frenchmen's love of *gloire* or his pride of race, his admirable virtues and his amiable vices. These are, however, matters for the historians to discuss and not for other professions to decide.

When we consider the career of Alexander we find ourselves in closer touch with the history of science and of medicine as a part of it and we see more clearly that man's destiny is greater than man. There is a determinism which guides it, whose laws are more evident than those a certain school of biologists, the old school of orthogenesis and its modern representative in the persons of Bateson and Keith, have intimated may yet be discovered for living things. One can easily perceive from the pages of Xenophon and Herodotus that the Oriental world was a giantess tottering to its fall even in their time and that the hardy sons of rock bound Greece were sure sooner or later, not alone to stop her, as they did at Marathon and Platæa, but to shatter her power far within her own boundaries. So Charles Martel did at Poitiers and Tours and Napoleon under the Pyramids, the former when Arab orientalism was held back from the mountains and valleys of Central Europe, the latter when he brushed aside the Mamelukes. We see dimly enough perhaps, but yet we can not fail to comprehend that forces, more or less ruled by biological and physical laws, shape the fate of nations and civilizations and man, however transcendent his ability, is but the instrument of a generation which gives birth to a new generation and a new instrument to keep them true to their destiny, shaped by the laws of Nature.

There is a curious reciprocation in the advance of science, in the ebb and flow of mighty forces fighting in the pages of history, which sometimes escapes detection—the east against the west, but there seems no doubt we of the west derive through the Nature Philosophers of the Asiatic Greeks the beginnings of our western science. There seems scarcely less doubt that these men did not create their cosmic theories *de novo*. They quite evidently had them from the oriental civilizations of Babylon and Egypt and India, perhaps China. Three hundred years later, so Dr. Moll thinks, the death of Alexander arrested the destinies of civilization. I am not sure he means they were more than arrested. It could not have been for long. He but pricked the hollow bubble, which appeared so solid to Herodotus and Xenophon, but he carried in his train the savants of Greece to the East, as Napoleon carried the scientists of France to Egypt. The latter carried back these flowers which had sprung up from the clumsy carcass of Arabian orientalism, which in its turn had fed on the science of Aristotle and Galen and we, almost in our day, have passed the torch on to Japan and now to China. In the mighty dash of forces like a shuttlecock or the foam of the sea science has been kept in the air passing back and forth, and in the face of these forces Napoleon and his great predecessor, Alexander, look puny indeed.

In this mighty battle of forces, they, like the phantasmagoria at the mouth of Plato's cave, silhouetted against the gloom behind them, are seen by the student of history, if he is successful in synthetising its lessons. We find the historians of medical science in confusion as to whether the Hindu Susruta is an oriental corruption of some of the books of the Hippocratic Corpus carried to them by the medical staff of Alexander's forces or by those who followed in their wake as far as the Ganges, or whether the Hippocratic books, long before Alexander, had derived their lore from the science of the East. As to this all the impartial student can assert is that surely one spring of knowledge was diluted with the waters of the other, indeed deeply impregnated, for some of the passages can be almost literally rendered by the lines of the other. When we take up the records of the Arabians and what they handed on to Europe—Rufus of Ephesus for instance—we are again baffled to know which is which, what is oriental and what is occidental science. History in these instances, and in many like them, supplies us with a commentary on Kipling. East may be East and West may be West, but neither the seven wise men of ancient Greece nor the seven times seventy wiser men of modern science have been able to disentangle the fringes of history woven by mightier hands than those of Alexander, or Cæsar, or Napoleon.

HOSPITALS FOR CHRONIC DISEASES

One of the many misconceptions concerning institutions for chronic diseases is the idea that patients in these hospitals require only elementary nursing care. Indeed, the excellent report issued recently by the Committee on Nursing Education recommends that such institutions are the proper sphere for trained attendants. In a recent article it has been pointed out that many of the inmates of hospitals for chronic diseases require highly skilled and specialized medical and nursing care (Nursing Service in Hospitals for Chronic Diseases, Ernst P. Boas, *The Modern Hospital,* August, 1923). It is well known that in too many cases they have been left in the charge of ignorant and unskilled attendants. A properly conducted and equipped hospital for chronic diseases must be manned by a large number of skilled and conscientious graduate nurses. Such an institution, if it is of sufficient size, offers excellent material for the education of pupil nurses, if proper affiliations are arranged. The psychology of a chronic patient differs considerably from that of a patient ill only a few weeks. A nurse who has learned to handle such a patient is better qualified for all branches of her work than is the nurse acquainted only with patients suffering from acute disease.

The present tendency in nursing circles to provide better education for pupil nurses is directed largely by the desire to produce well trained young women for public health work and for the administrative nursing field. In the enthusiasm of the moment the need for the conscientious bedside nurse who has learned the art of alleviating the suffering of individual patients is largely overlooked. The report on the nursing needs of institutions which care for chronic patients is therefore very timely, emphasizing as it does a wider sphere of usefulness for the ordinary trained nurse. The leaders in the field of nursing education while striving to increase the educational opportunities for the more specialized type of nurse must keep in mind the undiminished need for a large number of well trained and conscientious bedside nurses.

THE NATURE OF PLASTIC LINITIS

The nature of plastic linitis—Brinton's disease—has been the object of much discussion, some observers regarding it as a purely fibrous process, others considering it epithelial in nature. Both these opinions have been defended with numerous arguments in their favor. A purely fibrous linitis may really exist in the same way as an infiltrating carcinoma of the stomach, erroneously described, we think, by the name of cancerous linitis. Brinton thought that linitis was caused by the deposit of a plastic substance between the meshes of hypertrophied connective tissue, and he also pointed out that muscle, connective tissue, and mucous membrane all assumed an abnormal aspect and stated that it was clear that all these structures owed their increase in thickness to the presence of the same substance whose uniform infiltration was one of the principal characters of the lesion. A deposit is found whose slow but fatal action attains all the gastric layers and produces a thickening of the muscular stratum of the organ. Brinton and others have endeavored to distinguish this process from malignant disease.

According to Brinton, Lebert and Broca, the tunics of the stomach remain quite distinct, the muscular fibre is usually respected; there is condensation and retraction of the tissue of the stomach *en masse,* giving the organ the consistency of cartilage. No gastric juice can be expressed, the lymph nodes are intact, there is no trace of epithelial elements, the infiltrated tissue is unlike the stroma of cancer (Brissaud) and nowhere does it interfere with the vitality of the normal cell elements (Brissaud).

The partisans of the epithelial theory—among them Chauffard—point out that linitis is prone to occur between the age of thirty to forty years, it is not preceded by any form of gastritis and its evolution is much more rapid than gastritis. Analysis of the gastric secretion shows an absence of free hydrochloric acid, and although leucocytosis does not exist it must be recalled that this only arises in the advanced stages of gastric cancer at a time when the growth has undergone ulceration. Bret and Paviot attach much importance to the fact that linitis occasionally extends to the transverse colon and the mesocolin. They also regard plastic linitis as cancerous in nature, from the fact that they found isolated islands of round cells in the submucosa, assuming a protoplasmic atmosphere in the transverse colon and frankly epithelioid in the ovary.

As a third argument these observers maintain that the lesion in the submucosa is not a sclerosis. In the first place, the submucosa is the route for an easy extension and is therefore chosen by infiltrating gastric cancer. Secondly, if the process were a sclerosis secondary to chronic gastritis, why they argue, should the sclerosis be more marked in the submucosa than in the mucosa itself? Why is the oldest sclerous tissue—the nearest to the adult type—not in the interglandular spaces? Why does this extensive sclerosis of inflammatory origin never present the completely adult type of connective tissue and is the only tissue found that all observers unanimously qualify as fibroid, and never presents large connective tissue fibres brightly stained by carmine? In reality, at the base of the mucosa is seen rows of young cells deeply stained, with an almost continuous extension sending off brightly stained prolongations between the muscular fasciculi of the mucosa and then become lost in the submucosa, without any trace of adult connective tissue fibres. It is in the gastric subserosa that this fibroid tissue is found, and, as Garret has pointed out, the lesions of the mucosa are distinctly consecutive to a submucous neoplastic process and not so old. In the cases studied by Brinton, he insists upon the integrity of the mucosa and states that the functions of secretion have, so to say, not undergone any change.

Clinically, plastic linitis ends like ordinary gastric cancer in the vast majority of cases. After a more or less long period of insidious and badly defined digestive disturbances, which might be attributed to chronic gastritis, rather sharp and frequently spontaneous pain occurs in the epigastrium and hypochondrium. At the same time there is vomiting of food or mucus, the vomitus rarely being bloody, and hematemesis of any considerable amount is uncommon. The general health quickly declines and the progressive, fatal evolution of the process ends in death between eighteen months and three years.

Briefly expressed, the term plastic linitis must be reserved for those cases only in which the fibrous infiltration of the stomach is devoid of any trace of epithelial elements.

SOUND TEETH

A distinguished clinician has made the statement that we know little about personal hygiene. It is an unusual remark and is not so far from the truth as might be supposed on first hearing. In regard to the teeth, however, we are learning by leaps and bounds and are getting certain of facts which sound new but are very old—facts that should have been evident to anyone not raised a human being. We have special reference to the most common of all diseases—dental caries, and to its cause and prevention.

An experiment on a large scale was carried out by Dr. Fones in the Bridgeport schools. For five years a large group of specially trained dental nurses were set to work cleaning, by precept and practice, the mouths of the school children. Work was begun with the first grade children. At the beginning of the experiment the children showed an average of seven cavities per child. At the end of five years, or when the children had reached the fifth grade of school and about the twelfth year of life, it was found that, with the daily use of brush and paste, and the special cleanings by the nurse once or twice a year, the children averaged 4.6 cavities per child. Apparently something had been gained, but only apparently. Dr. Wheatley, of Shropshire, England, examined the mouths of 2,217 untreated school children from six to seven years of age—or at the period of our first graders, and 1,417 children, also untreated, at the age of twelve. The former had an average of 7.1 carious teeth per child, and the latter 4.95. A study by the New York Association for Improving the Condition of the Poor showed a similar decline in children with uncleaned teeth of from seven cavities at five and 6.7 at six to 4.7 cavities at twelve years of age. In other words, the drop in number of carious teeth per child in these untreated children was practically the same as in the Bridgeport children who had been scraped and brushed.

Now comes Dr. DeW. Cross, director of the Forsyth Dental Infirmary, and says (what we ought to have known) that proper diet on the part of the mother and on the part of the child "are the things that make teeth, and not the use of the tooth brush. Mothers, before the baby comes, must take the responsibility of giving good or bad teeth to their offspring, and before six years of age the whole question of good teeth for life will have been decided." All adult dentistry diseases, except pyorrhea, are the result of poor teeth development or neglect of proper diet and hygiene during childhood.

As for the tooth brush and tooth paste, they are placed by these definite facts of hygiene in the same class with soap and wash cloth—tools to make a man feel better and more agreeable to society but not more healthy than if these means of cleanliness were unknown. We might have learned as much, by consulting the wild animals, long ago.

VALUE OF SAFETY CAMPAIGNS

During the last few years many cities have made a special point of accident prevention work in their industrial plants, and the results have been very striking. An outline of this work, particularly that in St. Louis, was given by C. W. Price in an address during safety week, recently celebrated in that city. In 1917, industrial accidents were responsible for the deaths of 110 workmen in St. Louis; in 1922, only fifteen were fatally injured, in spite of the large increase in the number of employees. This result was attained through intensive educational work along safety lines in individual plants and also through a community safety campaign, which, it was easy to see, greatly influenced many workmen to adopt safe practices in their work and to avoid and condemn unsafe ones. Another example of this decrease in hazards was shown in the record of the Ford Motor Company of Detroit, which in 1920 had but one fatal plant accident among the fifty thousand employees, while ten workmen lost their lives outside the factory.

There has been also an increasing interest on the part of employers in commercial traffic, probably because of the fast increasing number of business vehicles on the streets, and also because of the increasing cost of public liability insurance. The chief methods recommended by Mr. Price were systematic daily safety instruction in the public schools, a continuous poster campaign on the streets, and a well arranged campaign in the daily press. Probably one half of all that can be done in any community to reach the adult population is to be effected through the safety education of the school children, who carry the safety message home to their parents.

Washington, it was stated, has very successfully worked out the socalled visualizing of safety on the streets. Slogans with short, pertinent messages are displayed on street corners, at filling stations, on street cars, busses, and taxicabs, on school houses, public buildings and factories. These are changed monthly, and the superintendent of police reports that in two months the total number of accidental deaths has been reduced thirty-two per cent., traffic deaths forty-three per cent., and those of children sixty-five per cent.

THE ILLEGITIMACY ACT OF NORWAY

An article in a recent number of the *Journal of Social Hygiene* discusses the working of the widely known Norwegian illegitimacy law, called the Castberg Act. It reports that it is the consensus of opinion among officials in Christiania that the results are very satisfactory. Illegitimacy has not increased, the law has given no occasion for blackmail, and the condition of illegitimate children has been greatly improved since the passage of the law in 1915.

This act provides that the State becomes responsible for establishing the paternity of the child, and for its maintenance. The mother reports to the local authorities, who see to it that the father, except of course in certain cases, supports both mother and child. This support must be in accordance with the means of the better situated of the parents. Maintenance is required for the child until the sixteenth year, sometimes longer. The mother is required to share in this support if her circumstances permit, and the child inherits from the father's line as well as from the mother's, but the property relations of the husband and wife are changed to prevent any child that may be born out of wedlock from inheriting from either spouse property that has come into the marriage through the other. If the father should default or abscond, the State cares for mother and child and there is no loss of citizenship attached to relief in such a case. If the child's paternity cannot be established, two or more men, either of whom may be suspected to be the father, may be ordered to contribute to its support. Needless to say, severe penalties are provided for a mother who accuses a man falsely of being the father of her child.

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Obituary.

P. W. LATHAM, M.D., F.R.C.P.,

London.

A short time ago the death was recorded of Dr. Arthur Latham, the well known authority on tuberculosis, and on October 29th, his father, Dr. P. W. Latham, for twenty years Downing Professor of Medicine at Cambridge University, died at Clifton, Gloucestershire, about a week after completing his ninety-first year.

Peter Wallwork Latham was born at Wigan, Lancashire, on October 21, 1832. His father was a medical man. He was educated at Wigan and for a time was apprenticed to his father. At that time apprenticeship was part of the medical curriculum. He then entered Glasgow University and afterwards Cambridge University. In the Mathematical Tripos of 1858 he was nineteenth wrangler, but was more successful in the Natural Science Tripos of 1859. He was one of the two in the first class and gained distinction in five subjects. After travelling in Germany he was appointed assistant physician to Westminster Hospital, from which position he resigned in 1863 to fill the offices of physician and clinical lecturer at Addenbrooke's Hospital and medical lecturer at Downing College, Cambridge. When he first returned to Cambridge, Latham interested himself in tuberculosis, a line which his only son, Arthur, afterwards followed with great distinction. In 1860 he was elected to a Fellowship at Downing College and in 1874 was made Downing Professor of Medicine, a post which he held until 1894.

As a lecturer Dr. Latham was very successful and commanded the respect of the students. He was a sound, able and accomplished physician of fine and dignified presence and with kindly and courteous manners. As a writer Latham was not prolific, but what he did write was well worth reading. His leaning towards the chemistry of the body is exhibited in his Croonian Lectures, in which he discusses the pathology of rheumatism, gout and diabetes, and again in his Harveian Oration. He formulated a highly ingenious but impracticable theory concerning the molecular structure of living protein. He contributed articles to Quain's *Dictionary of Medicine* and various papers on the symptoms of phthisis, the etiology, pathology and treatment of typhoid fever, the formation of uric acid in animals and blood changes in disease.

LIEUTENANT COLONEL LEAVITT

United States Army.

The Adjutant General's Office of the State of Nevada has sent out memorial resolutions on the death of Lieutenant Colonel Granville Ernest Leavitt, who met death by drowning on September 17, 1923, while on a hunting expedition. Dr. Leavitt was born in California in 1872 and was a member of the governor's staff. He was given a military funeral.

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News Items.

Dr. S. Josephine Baker Appointment.—Dr. S. Josephine Baker, of New York, has been appointed consulting director in maternity and child hygiene of the United States Children's Bureau, the Department of Labor announces.

Dr. Shuman Back in America.—Dr. John W. Shuman, formerly director of internal medicine at the American University of Beirut, Syria, is now engaged in private practice in Los Angeles, Cal. He is associated with Dr. Carl E. Conn and Dr. A. M. Pond.

Third Harvey Lecture.—Dr. Walter A. Jacobs, of the Rockefeller Institute for Medical Research, New York, will deliver the third Harvey Society lecture at the New York Academy of Medicine, on Saturday evening, December 8, 1923. His subject will be Chemotherapy of Protozoan and Bacterial Infections.

Post-Graduate Medical School Lecture Schedule.—The following lectures on Friday afternoons at 5 o'clock at the New York Post-Graduate Medical School and Hospital are announced: December 7th, The Importance of Early Diagnosis in Diseases of the Genitourinary Tract, by Dr. Joseph F. McCarthy; December 14th, Radium Therapy (with moving pictures), delivered by Dr. George S. Willis.

Riverside Medical Society Organized.—The Riverside Medical Society of the City of New York has recently been organized, made up of physicians located in the West End section of New York City. The society has for its object the advancement and study of medical and kindred sciences as well as the promotion of good fellowship among its members through various social functions to be held during the year. The officers for the coming year are Dr. Isador W. Kahn, chairman; Dr. Martin Cohen, vice-president; Dr. M. Murray Peshkin, treasurer, and Dr. Samuel Morse, secretary.

President Coolidge Head of Gorgas Institute.—President Coolidge has accepted the honorary presidency of the Gorgas Memorial Institute of Tropical and Preventive Medicine. Many prominent physicians as well as leading figures in the nation comprise the board of directors. The Gorgas Memorial Institute will be established at Panama City. It will conduct research in all preventable diseases and train men and women to assist in prevention. An endowment fund of $5,000,000 is to be raised by popular subscription. The directors decided to start a drive to raise this fund on January 1, 1924.

Foreign Correspondence.

LONDON LETTER.

(*From our own correspondent*)

London, *September 18, 1923.*

NEW MINISTER OF HEALTH.

It seems but the other day that the announcement was made that Mr. Neville Chamberlain had been appointed Minister of Health. Nearly all the community and perhaps the medical profession especially were congratulating themselves that the minister possessed most of the qualifications which should go to make a successful holder of the position. Mr. Chamberlain, during the short time he occupied the ministry, amply fulfilled these rosy anticipations and everyone hoped that his stay would be long. But the exigencies of politics come before everything else.

The Ministry of Health is without doubt one of the most important Governmental departments, if not the most important, although unfortunately the public, through lack of knowledge, do not view it in this light, and it is against its smooth and effective working that its titular head should be constantly changed. Such changes tend to destroy or impair confidence in its powers for good. It is perhaps not in the best interests of public health that the department should be subjected to political influences, that is, to any great extent. It must be also borne in mind that the Ministry of Health has to deal with one of the most difficult problems of the day, that of housing. It is a burning question and one in which the strong Labor Party are intimately concerned and it may be said also that no question at the present time more closely affects the health of the people. If the population were properly housed there is absolutely no doubt that better health generally would result. Therefore, not only is a strong man needed in the Ministry of Health but moreover one who will stay in office long enough to carry out his policies.

The newly appointed Minister of Health, Sir W. Joynson-Hicks, has been in Parliament for some time and is regarded as a rising man, and it is to be hoped that he will retain his post sufficiently long to effect a few of the numerous reforms projected in the interests of health and housing reforms in particular.

PAYING PATIENTS IN A LONDON HOSPITAL.

King's College Hospital, one of the large London hospitals, is shortly to devote another ward to paying patients. This new departure for England was started in King's College Hospital purely as an experiment in 1921, when six of the ordinary wards had to be closed owing to shortage of funds. It has proved so great a success that it has been decided to extend it. The three existing paying wards provide accommodation for fifty patients, the new ward will bring the accommodation to over seventy, and there are also eight private rooms. Ward patients pay five guineas a week with an additional fee for the medical staff, which is fixed by the governor of the hospital. Those desiring private rooms are charged eight guineas a week. In the new ward curtained cubicles will be available at four and a half guineas a week. The system is a boon to small professional people and those who could hardly bear the strain of a private nursing home or a specialist's fee. It has, however, been thought by some that the growing number of private patients might detract from the original charitable purpose of the hospitals. All hospitals in Great Britain were founded as charities and remain so. On the contrary, it is stated that the extra income from paying patients actually enables the hospital authorities to maintain more free beds than otherwise could be done and helps to defray the enormous cost of equipment and so on. Also the hospital authorities are taking every precaution to avoid clashing with the interests of general practitioners, and with this end in view a scheme was being considered to allow general practitioners to treat private patients within the hospital whenever practicable. An attempt is also being made to devise a scale of charges which will include the staff doctor's fee, and so avoid the necessity for the fixing of this according to the patient's financial position. At present the fee is not left to the physician or surgeon himself, because it is found that he is inclined to be too generous, to his own detriment. In many cases, the patient's fees are paid by some corporate body, such as a church society, and the result has been most happy. From June 1, 1921, to August 31, 1923, paying patients in King's College Hospital numbered 1,293, compared with 12,635, a relatively small proportion.

CANCER CAMPAIGN IN GREAT BRITAIN.

Cancer, in spite of the advances which have been made, both in diagnosis and treatment, is still the most common single cause of death in persons over thirty years of age, and is becoming so in an increasing degree. During 1920, in England and Wales, nearly 43,000 persons of thirty and upwards died from cancer. In 1921, the last year for which the Registrar-General's figures are available, the corresponding number was 45,328. During that year one in every seven deaths from the age of thirty upward was caused by cancer. We are still ignorant both of the causation and the cure of cancer. Many other diseases have yielded their secrets to patient investigation, and there is no reason to suppose that the problem of cancer will not eventually be solved, yet thousands of suffering men and women, and those who suffer with them, are asking how long they must wait, and if there is nothing that can be done to hasten a discovery which will bring relief to those whose outlook is today so hopeless. The answer to this question is clear. The first step towards finding the cure of cancer is to discover its cause. To find this cause no effort must be spared. Every possible line of research must be diligently explored. More men must be set free to devote themselves wholly to research, and their work must not be hampered or prevented by want of money. Much research work is being carried on, and considerable advances have been made in the technic of operations designed to remove the disease in its early stages or retard its progress in more advanced cases. All honor is due to those who have or are doing the work, but a vast amount still remains to be done.

Impressed by the need for immediate action we have joined together to found a movement which will coordinate and support research on cancer throughout the British Empire. This new concerted movement will be called the British Empire Cancer Campaign. It will be governed and directed by an executive council, the members of which will act as chairmen of small working committees, each dealing with a separate aspect of the cancer problem. Medicine, surgery, human pathology, chemistry, physics, radiology, animal and plant pathology, hygiene and vital statistics will all be represented by committees, whose work will be coordinated by the executive council, acting, in fact, as a central clearing house. The council is anxious to make it clear from the outset that it has no wish to interfere with the work already being carried out. Individuals and institutions now working on the cancer problem will be helped and encouraged, and where practicable, financially assisted. In this way investigation can be carried out simultaneously along many lines, and the results of these inquiries will be brought into the common stock of knowledge. A discovery in any one branch will be made known to all, and may lead to discoveries in other branches.

It is in this coordination of effort that our most confident hopes are placed. No one can say with certainty that we shall succeed in our quest to find the cause of cancer, but a movement so broad must inevitably advance the knowledge which we have of this disease, and every step forward brings us nearer to our goal. The British Red Cross Society has placed its organization and machinery at the disposal of the council of the campaign, and a generous donor has already given a sum sufficient to cover the preliminary expenses of this appeal. All future contributions will, therefore, be expended in encouraging, assisting, organizing and administering systematic research and treatment on a scale that has hitherto been impossible. To do this a large sum of money will be needed, and we appeal with confidence to the British public in the United Kingdom, and in the Dominions and Colonies overseas. During the war we had ample evidence of the capacity of this Empire for united and intensive effort, and in no field was it more effectively shown than in the relief of suffering and the prevention of disease. Is it too much to hope that the same spirit will animate our people when they are called upon to wage war against an enemy that is in their very midst? We plead with all earnestness that we may be given the means wherewith to carry through the task which we have set ourselves to accomplish, and thus to bring relief and hope to those who lives are now darkened by suffering and despair.

Sir Thomas Horder, who is one of the most able physicians of the country, wrote in the Sunday *Times* recently on the campaign. He pointed out that this new effort in England, conceived upon a very broad and very intensive scale, was, if anything, overdue. The question at issue is a vital one; it is not a question for the doctors only, it is a question primarily for the community. He goes on to say that it is intended that the money subscribed to the fund through the Red Cross Society, whose splendid machinery is being utilized for the purpose, shall be disbursed in a number of ways. There is not only the question of laboratory research, there are the very large questions of accurate statistics of clinical bedside observations, of the collection and classification of literature for reference, and of the critical examination of methods of treatment advanced by members of the profession and of laymen. The Executive Committee of the campaign will act as a clearing house of information regarding all the aspects of cancer. At present no such clearing house exists; much work is being duplicated and the same avenues of research are being explored by different workers who are largely in ignorance of each other's efforts or of the results of similar work already done. The value attaching to the association of men of experience in several branches of medicine and science is obvious when it is realized that no one can say today from what quarter light may come. For this reason the field of inquiry is being made as broad as possible.

LATIN AMERICA NEWS LETTER

(*From our own correspondent*)

Balboa Heights, *November 12, 1923.*

PANAMA CITY MILK SUPPLY.

Dr. Henry Goldthwaite is the authority for the statement that there are few places in any country where the milk supply is purer than that sold in the city of Panama. The standard for the bacterial content of the pasteurized milk sold in the terminal cities is two thousand bacteria to the cubic centimetre and the greater part of the milk supply averages between five hundred and fifteen hundred. This compares most favorably with many cities in the United States, where the bacterial content is sometimes as high as one hundred thousand. A considerable proportion of the raw milk produced in the Panama district averages from ten thousand to thirty thousand bacteria to the cubic centimetre. The milk industry has expanded wonderfully in the past four years into the Sabanas district. Four years ago there was little or no system in the control of dairies and the first records kept of the twenty-five dairies at that time showed that their total production amounted to about forty thousand pounds of milk a month, or about seven thousand bottles of the size known as fifths, or five to the gallon. Owing to the improved milk code which the Health Department of the Panama Canal adopted, systematized hours of milking, and of cleanliness, and the stimulation of the introduction of high class dairy cattle, four hundred thousand pounds of the best grade of milk is now produced. Formerly, milk was not very extensively used, the general public having a prejudice against using such a filthy pabulum. At present the supply, although it is increasing rapidly in amount, cannot keep pace with the demand. Practically all the milk is pasteurized. Herds are regularly tested with tuberculin and all infected animals are segregated from the herds. The Panaman government now has under consideration the appropriation of $10,000 for the purchase and destruction of infected cattle. It is now forbidden to sell bulk milk, only milk in approved bottles and well iced being permitted to be sold. The production of safe milk in the tropics has always been considered an exceedingly difficult matter. Many tropical places are almost wholly without fresh milk of any sort. The production of an adequate, safe milk supply at Panama is therefore another triumph for American sanitation.

ALASTRIM IN JAMAICA.

Reports from the island of Jamaica indicate that the epidemic of alastrim has assumed endemic proportions. Since midsummer, 1920, the island had never been free of the disease, and during the week ended October 20, 1923, twenty-three new cases were reported. None of these occurred in Kingston and visitors need have no fear in visiting that city, in fact, anyone who is well vaccinated against smallpox need have no fear of the disease and anyone who is foolish enough to travel without having first been vaccinated deserves to have it.

ANTITYPHOID INOCULATION IN TRINIDAD.

The health authorities of the island of Trinidad have begun a campaign of free antityphoid inoculation which is meeting with general acceptance.

MEDICAL ASSOCIATION OF THE ISTHMIAN CANAL ZONE.

The 203d meeting of the Medical Association was held at Santo Tomas Hospital on November 16, 1923, and the following program presented: Occupational Therapy in the Treatment of the Insane, by Capt. G. E. Hesner, M. C., U. S. A.; Eventration of the Diaphragm, by Lt. Col. Roger Brooke; Pituitary Gland, by Dr. D. G. Sampson; Observations on the Chemistry of the Blood in Epilepsy, by Dr. D. G. Sampson and Mr. J. E. Jacob; Presentation of Cases by Dr. H, J. Hayes, as follows: Progressive muscular atrophy, pellagra, with skin lesions, and cerebrospinal syphilis.

FREE VISUAL EXAMINATIONS FOR CHILDREN OF PANAMA CITY.

The Rotary Club of Panama City has inaugurated a campaign for providing without cost suitable glasses for children who are unable to purchase them. Through the kindness of a physician, who is a member of the club, and an optical manufacturer, also a member of the club, examinations will be made free of charge and glasses will be furnished at their cost to the club.

RESEARCH STATION ON BARRO COLORADO ISLAND.

On April 16, 1923, the Governor of the Panama Canal set aside Barro Colorado Island in Gatun Lake as a Natural Park where the regional flora and fauna may be propagated and studied and a number of scientists have already availed themselves of the opportunities thus afforded of conducting research in this favorable situation. The first reconnaissance of the island was made by Dr. William Morton Wheeler, of Harvard University; Mr. James Zetek, of the United States Department of Agriculture, and Dr. Richard Strong, dean of the School of Tropical Medicine at Harvard University. As a result of their studies a number of new and interesting species of termites and ants were discovered and much light was thrown on their life habits. Later Dr. Hitchcock, Dr. Maxon, and Dr. Cook, of the United States Department of Agriculture and the United States National Museum, visited the island and made several valuable botanical finds, and Mr. R. C. Shannon, of the United States Bureau of Entomology, built a shelter there and lived in it for two months while he studied bloodsucking flies. Dr. Frank E. Lutz, associate curator of the American Museum of Natural History, is now on the island conducting a series of observations on the habits and species of stingless bees, a very destructive pest of citrus plants. Dr. W. C. Allee, associate professor of zoology at the University of Chicago, will come in January under a grant from the National Academy of Sciences, to work out important soil and air problems on the island. Dr. Thomas Barbour, a noted herpetologist and zoologist of the Museum of Comparative Zoology at Harvard, will soon come to the Isthmus for the purpose of directing the erection of a number of screened buildings which the National Research Council will build on the island. The geographical position of the Isthmus makes this research station of tropical biology one of the most important in the world and it is expected that students and scientists from many portions of the globe will come to study the plants and animals there.

HEALTH CONDITIONS IN VALPARAISO, CHILE.

Press reports indicate that Valparaiso is again in the grip of epidemics of smallpox and typhus fever. On October 18, 1923, the following movement of patients was reported in the lazaretto Salvador of Valparaiso:

	Smallpox.	*Typhus.*
Entered	0	8
Died	9	3
Discharged	0	3
In bed	3	89
Convalescent	3	23

According to the official census of January 1, 1923, the population of Valparaiso was 188,875.

OCTOBER REPORT OF THE COLON FREE CLINIC.

The Cristobal Woman's Club is still continuing the Colon Free Clinic and Soup Kitchen. Dr. J. L. Byrd, the health officer of Colon, reports that during the month of October the following work was done:

Medical cases treated	219
Surgical cases treated	523
Eye, ear, nose and throat cases treated	169
Babies treated	108
Prenatal cases treated	13
Dental cases treated	23
Vaccinations performed	89
Specimens to laboratory	14
Wassermann reactions performed	5
Diphtheria antitoxin given	3

GENEVA LETTER

(*From our own correspondent*)

Geneva, *September 15, 1923.*

ENTAMEBA AND SPIROCHETA IN PYORRHEA.

(*Concluded from page* 649)

GIEMSA PROCEDURE.

For the slow Giemsa procedure—which Zouraboff considers far the best of any—the preparations were left for twenty-four hours in a 1:20 Giemsa solution in melted snow, after which they were washed in running water and examined under oil immersion.

Leishman's method also gave good results. The preparations, air dried and treated with methyl alcohol, were covered with a few drops of Leishman's solution which was allowed to act for thirty minutes and then a double amount of melted snow was allowed to act on it for five minutes. This very rapid method is, as far as distinct staining is concerned, about equal to Giemsa. It gives rise to precipitates readily, but these can be avoided by agitating the preparation during the five minute staining.

OTHER STAINING METHODS.

Wiener's method was employed for staining the ameba of dysentery and, with some changes, gave rather good results for the staining of entameba gingivalis. The following technic was used: The preparation fixed with methyl alcohol was covered with a one per cent. solution of iodine for five minutes and then washed in water; stained with Löffler's blue for ten minutes, washed in water and lastly plunged in an alcohol solution of eosin diluted 1/4 with melted snow, for five minutes. This technic gave rise to precipitates.

Another very practical method for rapid research, especially from its simplicity and rapidity, is Manson's blue. After fixation with methyl alcohol the preparations were treated with Manson's solution, one drop diluted with four c. c. melted snow, for thirty seconds.

When stained with Giemsa, the ameba appeared as a large round or oval cell with distinct festooned contours. It varied in size between 10, 18, 20 and 28 micron. The ectoplasm of the organism, distinctly differentiated, stained a homogenous pale blue; the granular endoplasm could be distinguished especially by its round or oval digestive vacuole which varied in size according to the state of contraction of the ameba, so that in some preparations they were large and few; in others very small and very numerous. Violet stained bacteria could be distinctly seen within the vacuole, as well as bits of nuclei of leucocytes and salivary corpuscles. The nucleus stood out well, stained dark rose to red, assuming the annular shape and often the characteristic horseshoe form. Occasionally it was bilobate. In one instance it was found that the chromatin of the nucleus was distinctly separated into four parts or lobes. In the centre it presented a lighter corpuscle which was the nucleolus.

Wiener's method stained the protoplasm azure and the vacuole pale pink; the nucleus was darker pink. With Giemsa the ectoplasm and endoplasm could not always be so distinctly differentiated.

Manson's blue distinctly differentiated the ectoplasm in dark blue, the endoplasm in lighter blue.

DISTINGUISHING FEATURES.

It is important to note that each time several ameba were found in one spot they were invariably small, so that Zouraboff concludes that these were young organisms which had just been formed by division. In one preparation taken from a subject with the history of familial pyorrhea at a single spot eight ameba of equal size were seen. The same preparation also showed four small ameba closely tucked together. Their nuclei were vividly stained, the chromatic substance being very distinct. In another case of pyorrhea the preparation showed a beautiful group of three young ameba close together, while the protoplasm of two was in continuity.

Some observers—Newlin, Goodey and Wellings—have maintained that the bacteria and bits of nuclei seen within the vacuole were simply superposed on the ameba and that consequently this parasite could only feed by osmosis. Now, in Zouraboff's preparations, it was distinctly seen that some bacteria and nuclei were superimposed on the ameba while others were just as distinctly seen within the vacuola, both having a different focal distance so that it was impossible to be mistaken. And this observer concludes that far from feeding by osmosis, entameba gingivalis digests bacteria, salivary corpuscles and leucocytic nuclei in their vacuola. Red blood corpuscles were never found in the vacuola.

Newlin and Craig have stated that this ameba can give rise to cysts, but without denying that they can do so, Zouraboff states that he never found any in his preparations. The total number of subjects examined was ninety-three of both sexes, ranging in years from two to sixty-one. Of these ninety-three, fifty-one had pyorrhea and gingivitis. In these fifty-one cases the ameba was present in twenty-five—49 per cent. They varied in number and even in the different preparations made from the same subject. Thus, in four preparations from the same mouth and taken from the same spot, only one contained the ameba.

AGE OF PATIENT NO FACTOR.

In almost all the cases, besides the ameba, the spirocheta dentium was present as well. In nine cases of pyorrhea and gingivitis the spirocheta was present, the ameba absent. The frequency of the ameba in pyorrhea does not appear to be in any way related to the age of the patient, because it was found as frequently at the age of twenty years as in individuals near the sixties.

The ameba was present in 61.5 per cent. of cases of pyorrhea in the male and in 48 per cent. of cases in the female, so that the difference is not great. The ameba is not more common in mouths with dental caries than in those containing only healthy teeth. On the other hand, preparations made from material removed from the neck of a tooth always contained more than that removed from the interior of a carious tooth. Of forty-two subjects with healthy gums ameba were found in only one. Upon several occasions spirocheta were present in preparations derived from healthy mouths, but they were very few in number and never formed clusters such as are seen in cases of pyorrhea and gingivitis.

In one case the action of emetine hydrochlorate on the entameba gingivalis was studied. The patient, a male of twenty years, had lived in the colonies and contracted amebic dysentery. He also suffered from gingivitis and specimens from his mouth contained some very fine and numerous ameba associated with the spirocheta dentium. The patient had undergone a treatment with emetine at the dose of three centigrams twice daily for eight consecutive days as treatment for the dysentery. The material was taken from the mouth at the end of treatment and the preparations were free from ameba and only the spirocha from the gingivitis could be found.

Book Reviews

SKIN DISEASE.

Diseases of the Skin. By Frank Crozer Knowles, M.D. Second Edition. Philadelphia and New York: Lea & Febiger, 1923.

Diseases of the Skin. By Richard L. Sutton, M.D., LL.D. Fifth Edition. Revised and Enlarged. St. Louis: C. V. Mosby Co., 1923.

A most convenient textbook on dermatology. Most important is the author's concept of the human organism as an entity. His approach works from the organism with a regard for the integument as a portion. Of value to the practitioner are the diagnostic tables. Radium and x ray therapeutic methods have been rewritten to conform to more modern methods and findings. Ringworm has been found to be a causative factor in many obscure skin diseases and this subject has been handled from the point of view of the latest discoveries. The book is not as cumbersome as many other textbooks and for practical purposes should meet the requirements of the busy physician.

* * *

The fifth edition of Sutton's comprehensive textbook is of great value as the recent literature on the subject has been carefully gone over and the most essential references included. The illustrations which in a book on dermatology should be of a high quality are all that could be demanded. New headings have been given to many skin affections due to the factors pertaining to them which have hitherto remained obscure. Much of the contributed material from outside sources has come from the younger American dermatologists who are rapidly forging to the front as investigators. The fifth edition of this important book should be warmly welcomed.

THE HEART

The Heart, Its Physiology, Pathology and Clinical Aspects. By Selian Neuhof, M.D. Philadelphia: P. Blakiston's Sons & Company. 1923.

The aim of this volume is to present the entire subject of cardiac and cardiovascular disturbances and diseases in a clear, well balanced manner preeminently from the clinician's viewpoint. The first few chapters deal with embryology, anatomy and physiology. The chapter on physiology is limited to a consideration of impulse formation and conduction, and to the cardiac innervation. Inadequate attention is given in another chapter to the important subject of cardiodynamics and to the work of men like Straub, Starling, Henderson and Wiggers. A separate chapter is devoted to a superficial discussion of cardiac pathology. In the opinion of the reviewer it would have been wiser to discuss the pathology of each important affection of the heart in connection with the symptomatology. Such an arrangement helps the student to formulate clearer concepts of disease. Similarly, the clinical chapter on congenital heart disease, which is too short, could well have been combined with the anatomical one. The sections on the arrhythmias, and on the graphic methods employed in the study of heart disease, are fairly complete.

The author states on page 190 that pulsus paradoxus has been regarded as characteristic of pericarditis with effusion. As a matter of fact it has been associated with adhesive pericarditis. The discussion of myocarditis is unsatisfactory. The true infections of the myocardium are not clearly differentiated from the degenerative lesions. Thus the author speaks of myocarditis in pulmonary emphysema as the cause of the cardiac symptoms.

The last 170 pages of the book are devoted to cardiovascular clinics, case reports of a wide variety of conditions. They are out of place in a book of this nature. Brief references in the text to illustrate cases that are particularly illuminating would be of real value.

As a whole Dr. Neuhof's book, while it contains many facts and observations, is not well planned. The necessary correlation of anatomy, physiology, pathology and the clinic is not achieved. The references to the literature are not always well chosen. The illustrations, although numerous, are not well reproduced.

LEISHMANIASIS

Leishmaniasis y Blastomicosis en America. Por El Dr. Edmundo Escomel. Lima: Polvos Azules, 1922.

For those who read Spanish this little monograph affords interesting information concerning the occurrence, the lesions, the diagnosis and the treatment of leishmaniasis and blastomycosis, as it is found in South America. Apparently both diseases are more frequent there than has hitherto been thought. A useful table for the differential diagnosis of the two diseases is given, but it is pointed out that they may both occur in the same case. The pictures of patients suffering from blastomycosis show a much more serious type of disease than is usually seen in the United States.

GENERAL PRACTICE

An Index to General Practice. By A. Campbell Stark, M.B., B.S. (Lond.), L.S.A. (Eng.). New York: William Wood and Company, 1923.

This interesting and useful little volume of less than two hundred pages was written solely from the point of view of the general practitioner, and the matter under each heading, according to the author's preface, is to be considered as a syllabus of the subject rather than an attempt to instruct. The volume aims to benefit the general practitioner rather than the specialist. The author emphasizes the fact that in England, at least, writers of textbooks, makers of surgical instruments, and others who cater to the needs of the medical profession, have little to offer to the general practitioner, so that he is left to work out his own salvation.

The author attempts to make an exception to this general rule, and it must be admitted he has succeeded in writing a work that must have a certain appeal to the man in general practice. It is difficult to agree with much that is in the book, but in the main the teachings are conservative and useful. There seems to be a marked disproportion in the amount of space allotted to the various subjects, as may be judged by the three and one half pages devoted to alcoholism, the first subject considered, and the little over two pages given to the last subject venereal diseases. Gonorrhea gets less than eight lines, including the comment that "the following books will be found to contain as much information as he (the practitioner) is likely to need." The key to this interesting little work is found in this bit of philosophy: "It is better to be right nine times out of ten than to make a brilliant diagnosis in the tenth case." All of which might be submitted to some of our brilliant internists for serious consideration.

HYGIENE

Hygienisches Praktikum. Von Dr. Med. Paul Uhlenhuth. Zweite, neubearbeitete Auflage. Mit 86 Abbildungen im Text und einer Tafel. Berlin und Wien: Urban & Schwarzenberg, 1923.

This is an eminently practical handbook on hygiene for the use of medical students, those preparing for the position of sanitary inspector, and as a guide in hygienic laboratories. The various tests taught in the courses on practical hygiene are described in minute detail. In this edition many of the shortcomings of the former edition have been overcome, and the chapter on light and illumination has been completely rewritten. The subjects discussed are soil, water, the examination of foods in general, milk, butter and food fats, meat and meat products, flour alcoholic beverages, adulterations of foods, and commercial products, clothing, air and its movement, and light and illumination.

SURGEON GENERAL'S REPORT

The Medical Department of the United States Army in the World War. Volume I. The Surgeon General's Office. Prepared under the Direction of Maj. Gen. M. W. Ireland, M.D., Surgeon General of the Army, by Col. Charles Lynch, M.C., Lieut. Col. Frank W. Weed, M.C., Loy McAfee, A.M., M.D. Washington: Government Printing Office, 1923.

This volume deals with a complete report of the work as carried out by the Surgeon General's office and constitutes part of a series of reports on the work done by the Medical Department of the United States Army in the World War. The evolution of the Medical Department from the earliest times, both in the rest of the world and in this country, down to the time of the World War and of the Red Cross Medical Department units, are briefly reviewed. The first section details the relationship of the Medical Department within the War Department. The second section describes the organization and administration of the Surgeon General's office and its various divisions. The third section takes up the work of the various voluntary aids, such as the American Red Cross, the Council of National Defense, the National Research Council, the American Medical Association, and the Commission of Training Camp Activities. The appendix contains the orders, regulations, and other instructions governing the Medical Department during the World War, occupying about half the volume. The latter is the most important part of the report to the medical world, as it shows not only the development and organization of the various medical outfits, but also shows the progress of medical and surgical care of the army and the necessary prophylactic measures.

DIABETES

Die Hausärztliche Behandlung der Zuckerkrankheit. Erweiterte Bearbeitung eines Vortrags gehalten am 13. Dezember 1922 in der Berliner Medizinische Gesellschaft. Von Professor Dr. Carl von Noorden, Frankfurt a. Main. Berlin: Verlag von Julius Springer, 1923.

This monograph covers the treatment of diabetes by the general practitioner. The fate of the diabetic patient depends to a very great extent upon his mode of life. The author discusses the prophylaxis, the early recognition of the disease, the early and the late signs of diabetes, the general duty of the family physician and the special points of interest in the treatment, such as various dietaries, the starvation treatment, the avoidance of overfeeding, muscular work, the use of spring waters and drugs, the clinical treatment and coma. Not much is said about insulin, as at the time of this address very little was definitely known about it. With this exception, nothing but praise can be said regarding this article by a master on the subject of diabetes. The article is short and to the point.

HYDROTHERAPY

Prieger-Krebs Grundriss Der Hydrotherapie. Zweite Auflage Bearbeitet von Dr. Walter Krebs. Bonn: A. Marcus & E. Weber's Verlag, 1923.

Hydrotherapy has assumed quite an important place in therapeutics and is applicable in a great many diseases. The various methods of applying hydrotherapy in disease are discussed in great detail. In addition, the various types of physical therapy and their indications as adjunct treatment are also described. The first part of the book deals with the effect of hydrotherapy on the body, including the effect on the temperature, metabolism, the blood, the secretions and excretions, the musculature and on the nervous, the respiratory and circulatory systems. The second part deals with the technic, the direct and mediate effects of the various methods of applying hydrotherapy. The third part deals with the use of hydrotherapy in the different diseases. This little book may be highly recommended as a guide to hydrotherapeutic measures.

BACTERIOLOGY

Practical Bacteriology, Blood Work and Animal Parasitology. By E. R. Stitt, A. B., Ph. G., Sc. D. LL. D. P. Blakiston's Son and Co., Philadelphia, Pa.

The fact that this volume is now in its seventh edition is sufficient evidence as to its popularity. It has been necessary to incorporate considerable new matter since the appearance of the sixth edition two years ago, so that 132 new pages have been added, which brings the book well up to date. Even such recently published work as that of Guthrie and Huck on the existence of more than four isoagglutinin groups in human blood is referred to. In connection with blood grouping, Stitt has abandoned the classification of Moss, which he used in former editions, and on the recommendations of the special committee representing the American Association of Immunologists, the Society of American Bacteriologists, and the Association of Pathologists and Bacteriologists, has adopted the Jansky classification. Kolmer's modification of the Wassermann technic is described, as are the flocculation tests for syphilis, that of Kahn, Sachs and Georgi and Meinicke's third modification of the latter method. The appendix contains an interesting section on the problems of nutrition in health and disease, in which the vitamines and food deficiency diseases are described. This volume can be heartily recommended as an excellent laboratory guide, and as an exceedingly useful book of reference.

THE CLINICAL LABORATORY

Clinical Laboratory Methods. By Russell Landram Haden, M.A., M.D. St. Louis: C. V. Mosby Company, 1923.

This volume is the outgrowth of a collection of notebooks used in the development and standardization of the work in a hospital laboratory. For each procedure only one method is given, and Haden states in the preface that he has intentionally avoided the interpretation of results, as the book is in no sense a textbook. Hence its sphere of usefulness is considerably restricted. However, the methods used are clearly and simply described in most cases, though in a few instances one might choose rather more elaborate technic, gone into more fully. For example, the determination of the blood group of patient and donor for transfusion tests is one of the most important examinations that a laboratory makes. For this, Haden describes a macroscopic method. Most careful serologists and clinicians would feel safer if such tests were done by microscopic examination. The section on histological technic comprises some eight and a quarter pages, and while it includes the technic for staining mitochondria, it omits that of Warthin and Starry for the demonstration of spirochetes in tissues. A pathological laboratory is probably called upon as often to perform one examination as the other.

CHEMISTRY

Elementary Chemical Calculations. By Martin Meyer, Ph.D. New York: Oxford Book Company, 1923.

As its name would indicate, this book presents the fundamental mathematical calculations of the science. It consists of thirteen chapters treating individual types of problems and concludes with a final review of the whole. The appendix includes tables of atomic weights, vapor tension of water, Centigrade-Fahrenheit conversion, and convenient four place logarithms.

The arrangement of the material is novel and attractive. Each chapter opens with an introductory exposition of the principles involved, and this is followed by one or more typical examples fully solved. The chapters close with carefully graded lists of problems for the student. The information is highly condensed and includes practically nothing that is not absolutely essential. This makes it slightly difficult to read, but is more than compensated by the saving in time for the reader or student. The author has accomplished his avowed purpose of presenting a book which will accompany any standard textbook of chemistry, and without repetition of the latter, give the pupil a thorough knowledge of chemical arithmetic.

The volume can therefore be recommended as a good textbook and furnishes a handy little reference work for others than students. It is of high school or first year college grade, though probably more fittingly the latter.

THE CERVICOTHORACIC SYMPATHETIC

Le Sympathetique cervicothoracie. Par Docteur Thomas Jonnesco, professeur dans le Faculté de Bucharest. Paris: Masson et Cie, 1923.

Jonnesco's first operations on the cervical sympathetic for epilepsy and exophthalmic goitre date back to 1896, and at that time were very limited in extent. Then, after extensive study of the topographical anatomy, histology and animal experiments, he developed the surgery of the cervical sympathetic as no other surgeon has done. Subtotal resection, as he first resorted to, acted only on the encephalic vasomotor tracts, hence the inferior cervical ganglion was comprised in this resection, therefore including the first thoracic ganglion, with the result that total resection of the cervicothoracic sympathetic is now done. In addition to the treatment of epilepsy and exophthalmic goitre, this resection is now done for facial neuralgia, glaucoma, essential migraine and angina pectoris.

This volume in folio presents the work of a quarter of a century, and although the reviewer is fully aware that Jonnesco's work is not appreciated in the United States, it is nevertheless quite worthy of study by American surgeons. The book is illustrated with thirty-four figures and ten colored plates of great perfection. A very complete bibliography is appended.

HUXLEY

Essays of a Biologist. By Julian Huxley. New York: Alfred A. Knopf, 1923.

In this series of essays varied in the handling from the most serious to fantasy sketches, Huxley attempts to show the workings of biological phenomena in their relationship to evolution and to affairs of man. He reaches back over stretches of time and pleads for a broader concept of man's values of man. Of particular interest is his chapter on the biology of sex, in which he weaves in the most modern psychological findings. The book should stimulate many to new ideas and will serve to reaffirm others in certain stands they have taken.

EXPERIMENTAL PSYCHOLOGY

Abhandlungen und Monographien aus dem Gebiete der Biologie und Medizin. Herausgegeben von Alexander Lipschütz, Dorpat. Drittes Heft: Jonentheorie der Reizing. Von Dr. P. Lasareff. Mit 11 Abbildungen. Bern und Leipzig: Verlag Ernst Bircher Aktiengesellschaft, 1923. Pp. ix-51.

It has been shown that the electrically loaded atoms, the ions, play an important part in the phenomena of stimulation. Changes in the concentrations of the ions in the living tissue result under the influence of stimulation. If this concentration of the ions has exceeded a certain threshold value, changes in the surface tension of the atoms of the albumin result, and consequently also changes in the condition of the entire tissue (precipitation). The author endeavors to apply strictly physicomathematical methods to the investigation of psychic phenomena. The first two chapters deal with the basic principles of stimulative processes, and the stimulation resulting from the electric current. This principle is applied to the optic, auditory and gustatory sensations. This work is based on the author's experimental investigations. The remaining chapters deal with the dissemination of the stimulation, the geometrical arrangement of the distances between the neurons and the reflexes, and the activity of the centres. This brochure is of great value to those interested in the physiology of experimental psychology. A knowledge of the higher mathematics by the reader is assumed.

Medicoliterary Notes.

The Committee on Mental Hygiene of the New York State Charities Aid Association has issued a directory of the chief mental clinics maintained by general hospitals and public health agencies in the Manhattan district of New York City . . . It contains not only the location of the clinics, but such additional information as hours at which they are held, names of directors, scope, and charges, if any. —*Mental Hygiene Bulletin.*

* * *

Romain Rolland, author of *Jean Christophe,* has a degree in history from the Ecole Normale Supérieure, from which Pasteur, Bergson, and other famous Frenchmen have been graduated.

* * *

The Laity's Idea of the Physician is the title of an article of unusual interest published in a recent issue of the *Illinois Medical Journal.* It gives the results of a questionnaire sent out at the expense of Dr. James H. Hutton, of the Chicago Medical Society, to find out what people really think of doctors. The answers were very enlightening, often entertaining, and sometimes amusing. *New York Medical Week* considers the article so important that most of it is reprinted in the issue of October 13th, together with a clever little editorial on What the Doctor Thinks of the Public.

* * *

A list of selected books on the various phases of public health has recently been compiled and is ready for distribution by the National Health Council, 370 Seventh Avenue, New York. The list contains 175 titles grouped under the headings, administration and general public health, cancer, child and maternal hygiene, communicable diseases, foods and nutrition, health education, industrial hygiene, laboratories, mental hygiene, personal hygiene, public health nursing, sanitary engineering, school hygiene, social hygiene, and tuberculosis. A list of magazines on public health subjects is appended. The bibliography is intended to furnish to sanitarians and others interested information about the best books and journals on public health.

* * *

A circular letter sent out by the W. E. Traprock Expeditions, Inc., Hot and Cold Explorations a Specialty, enumerates the achievements of that famous and veracious explorer as follows: October, 1899, postgraduate course in exploration, Yale Forestry School; August, 1902, examination of causes of pollution in New Haven city water supply. (Practically no water was consumed by students during this period); June-September, 1904, research work among rivers of Westchester County, N. Y. Discovered sources of Bronx and its tributary, the Manhattan; February, 1907, headed relief expedition for devastated members of Russian ballet. Published Around Russia on Roller Skates. Degree of B.V.D., Omsk College, Siberia; August, 1910-September, 1912, discovery of Filbert Islands and establishment of Yale in Filberts (coeducational). Elected Fellow of the Royal South Seas Explorers' Union; July 1917, organized Derby Fencibles for protection of widows and orphans of inland cities; May-November, 1921, record trip to and from North Pole. Took close up photographs of earth's orbit. Published My Northern Exposure. Degree, Doctor of Northern Lights. Durfu College, Xenia, Ohio.—*New York Times.*

* * *

An interesting republication by Houghton Mifflin Company is that of the *Memoirs of Li Hung Chang,* by W. F. Mannix, known as one of the most remarkable literary hoaxes ever perpetrated. The book was written in a Honolulu jail, and its author was a brilliant but morally irresponsible journalist. Experts declared the book to be genuine, and it was only through some slight inaccuracies that the fraud was investigated and shown up for what it was.

* * *

Dr. J. Harvey Cleaver, of Los Angeles, is the writer of an interesting and entertaining article in a recent issue of the *Medical Herald,* published in Kansas City, Mo., on the value of personal hobbies. His contention is that the value of hobbies, under the classification of habits, "has no limit as a factor in promoting health." Nature herself, he tells us, recognizes this great truth, since for at least a third of the time she assumes the responsibility herself by inducing sleep.

* * *

Lady Into Fox, by David Garnett, is the novel of the year to receive the annual James Tait Black Memorial Prize, and also the Hawthornden Prize. This is the first time in England that the same book has won within the same year two such important prizes.

* * *

That hunger is the cause of much of the drug addiction of the present is argued by Courtenay de Kalb, writing in the *Manufacturers' Record,* Baltimore. "Hunger is the cause of the narcotic habit," he says. "It results from undernourished and overwrought nerves, seeking a palliative that should have been found in plenty of proteins and carbohydrates. During the war we used to shout, 'Food will win the war!' With equal truth we might say today, 'Food will prevent the narcotic habit!'" The article has at least a controversial value.

* * *

Both France and England now require medical tests for chauffeurs. If an unfit driver insists upon continuing his employment, the physician consulted must either warn the chauffeur's employer or be held responsible for a fatal accident at a later date.

* * *

Probably only a few persons know or remember today that the Yosemite Valley was discovered and named in 1851 by Dr. Lafayette Houghton Bunnell, who was born in Rochester, N. Y., in 1824, and who later resided and practiced medicine in the West.

Practical Therapeutics

THE TREATMENT OF DISEASES OF THE SKIN BY X RAY*

By Joseph Brumberg, M. D.,
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In treating diseases of the skin with x rays, unfiltered rays are used, filtered radiation being employed in but few cases. These unfiltered rays are measured, or their quantity calculated, and exact doses are given for various conditions. These formulæ and doses apply only to unfiltered radiation, and only when the rays have been given off from a standard type Coolidge tube, activated by an interrupterless transformer. The small bedside and fluoroscopic x ray units, which use a radiator type Coolidge tube, should not be used for treatment.

For computing the amount of radiation put out by a tube while in use, a formula has been worked out, the factors of which are the milliamperage and voltage of the current producing the rays, the distance of the tube from the skin area treated, and the time the skin is exposed to the radiation. If a tube is activated with three ma. and 700,000 volts (six inch spark gap), and an area of skin eight inches from the centre of the tube exposed for two minutes to this radiation, with no filter interposed between tube and skin, then the skin area so treated will have absorbed the largest amount of radiation that will not produce a reaction, and this is called the skin toleration dose, or one skin unit. One skin unit may be repeated to the same area every four weeks. One half this amount, or one half skin unit, can be repeated every two weeks; three eighths of the skin unit may be repeated every ten days; one quarter skin unit may be repeated every week, and one eighth skin unit twice weekly.

It is important to know just what harm is done to the skin by doses of x rays exceeding the skin toleration dose. Any reaction of the skin to x rays is radiodermatitis. First degree radiodermatitis is an erythema only, redness of the skin with burning and itching, selfcuring and not of any seriousness except when it is provoked on the face, for on the face even a first degree reaction may be followed after a time by slight atrophy of the skin, pigmentation and telangiectasis. In treating some serious dermatoses, particularly epithelioma, we use an amount of radiation greater than one skin unit, and deliberately face the prospect of producing a mild first degree reaction.

Second degree radiodermatitis follows the exposure of the skin to much larger doses. This reaction is marked by erythema, edema and vesiculation, accompanied by marked burning and pain, tends to spread to other skin areas, and requires several months to cure. Third degree radiodermatitis follows very massive doses of radiation and is marked by the conditions mentioned above plus ulceration or gangrene of the skin, excruciating pain and a chronic course; and when after many months healing takes place, there may follow as sequelæ on the damaged skin the development of keratosis and epithelioma. One should never, under any circumstances, knowingly give an amount of radiation that will produce a second or third degree radiodermatitis.

That this system of estimating x ray doses and the skin toleration to x rays can be depended on, is attested to by all dermatologists, and hundreds of thousands of patients have been so treated without danger. It is agreed, now, that idiosyncrasy to x rays does not exist, idiosyncrasy meaning here, that in certain persons a small amount of x rays will produce a violent reaction. Invariably, an unexpected reaction can be accounted for as due to error by physician or patient. The physician may be at fault through using faulty apparatus, in erroneous calculation of doses, or in repeating full doses before the necessary time limit has elapsed. Or the patient may be responsible for the reaction by interfering with instructions given to keep irritants off the skin. Some accidents of radiodermatitis are due to the simultaneous use on the skin of full doses of x ray and irritating chemicals like iodine, chrysarobin and others, and it is necessary before treating the skin with large doses of x rays to inquire whether irritating applications have been made within a week previously, and to warn against using such applications for several weeks after the treatment. It seems probable that the cases reported as idiosyncrasy, where the physician can find no apparent cause for the reaction, are really due to some ill advised interference by the patient. For example, a man with sycosis vulgaris, to whose face one half unit, a perfectly safe dose, was given, presented a week later a mild first degree reaction, an erythema. On further questioning, he told what he had at first concealed, that he had applied to his face right along a strong alcoholic solution of bichloride of mercury. Another instance: A patient was treated for epithelioma and a massive dose of x rays was given, from which not more than a mild erythema should have resulted. Two weeks later this patient returned with a violent second degree radiodermatitis, and said that, in spite of my cautioning her, neighbors had induced her to apply very strong solutions of lysol to the irradiated area. In both these cases the amount of x rays used was within safe limits, but the patient's own interference produced the reactions.

BIOLOGICAL ACTION OF X RAYS.

The biological action of x rays as used in dermatology, depends on their ability to destroy abnormal cells, or at least to limit their activity and to prevent their reproduction. The abnormal cells infiltrating the skin in various dermatoses are destroyed by amounts of radiation that will not affect normal tissue cells, and the clearing of skin eruptions under x ray treatment is due to this selective action, by which the pathological process is made to disappear and normal skin is spared.

This explanation of the biological action of the rays can be systematized to cover the various types of dermatoses requiring different methods of using the rays. Acute and chronic simple inflammatory diseases of the skin are characterized by infiltration of the derma with small round cells—lymphocytes. These cells are the least resistant and are influenced by small amounts of radiation. Such diseases are treated with one eighth or one quarter units, repeated every three or seven days respectively. The more stubborn inflammatory dermatoses show infiltration with fibroblasts in addition to lymphocytes, and require slightly larger amounts of radiation, three eighths unit repeated every ten days. Granulomata of the skin show infiltration with giant cells, plasma cells and epithelioidal cells, and to affect these one half to three quarter unit doses are required, this amount being repeated after two or three weeks. Neoplasms of the skin, epithelioma, and sarcoma, whose characteristic is overgrowth and infiltration with their particular malignant cells, the most resistant of all pathological cells, call for the use of massive exposures to x rays, from one and one half to two skin units. Fortunately, normal tissue cells are more resistant to radiation than any of these, and even when doses of two units are given for malignant disease of the skin, the normal tissue will recover quickly and satisfactorily. With the use of fractions of one skin unit, as employed for most dermatoses, the skin is never in any danger.

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*Read before the Buffalo Academy of Medicine, October 11, 1922

It is a much debated question whether x rays are antiseptic. Experimentally, bacteria in culture, in a test tube, are not killed by x rays. However, this agent does cure many dermatoses which are due to microorganisms, both bacteria and fungi. Either the x rays so change the tissue that microorganisms find conditions unfavorable for their growth, or there is elaborated in the skin and of the skin some new and more subtle influence which is antiseptic. There is some evidence that the second possibility may be a fact, and it is supposed that as a result of absorption of x rays by the skin, a new and different radiation is elaborated in the cells of the skin. If this does occur, the new radiation is not similar to x ray, but an electronic ray similar to the beta rays of radium, and this is supposed to be antiseptic.

ECZEMA, PSORIASIS, ETC.

In the large group of inflammatory dermatoses, the x ray is the method of choice. This group includes such common conditions as eczema, seborrheal dermatitis, dermatitis venenata, psoriasis and lichen planus. These diseases are marked pathologically, as to the epidermis, by parakeratosis, with spongiosis and vesiculation in moist conditions, and acanthosis in dry conditions; and in the corium by infiltration with lymphocytes and sometimes fibroblasts. This process is readily checked and made to disappear by small doses of radiation, the average being one quarter unit repeated weekly. From three to ten such exposures, varying with particular conditions, are required to eradicate the eruption. One of the first results obtained is relief from the itching or burning which accompanies many of these dermatoses. These symptoms are greatly relieved at the first exposure and leave after two or three exposures. Soon after treatment is started the vesiculation and oozing, or scaling, in the various types, is checked, infiltration of the skin becomes less and less, until the skin is restored to its normal condition.

Often these inflammatory diseases cover extensive areas, sometimes the entire body. It is safer not to treat more than one third of the body surface at one sitting. The usual practice is to expose on one day the face, scalp, and upper extremities, two days later the trunk, and two days after that the lower extremities, so that the entire body is treated in one week. In succeeding weeks the same division of exposures is repeated. In this way are avoided any toxemia and changes in blood cells which might follow the exposure of too great a body area to radiation at one time.

The advantage of x ray therapy in these conditions over older methods using external applications is that it is more dependable and more generally efficient. In addition, the relief from itching and burning is more quickly secured, and the duration of the eruption is shortened. Patients invariably prefer x ray treatment because it is quickly efficient and in addition, the patient does not have the inconvenience of applying medications, nor the annoyance of going about so anointed.

In eczema, seborrheal dermatitis, dermatitis venenata and lichen planus a permanent and lasting cure can be obtained. In psoriasis, x rays will quickly remove the eruption, but cannot prevent its recurrence at some future time; though it seems that when treated by x rays the eruption does not recur until after a longer period has elapsed than after treatment by external applications. Patients who have been treated for psoriasis by both methods are unanimous in prefering the x ray, because it is cleaner and more efficient than the application of reducing agents and there is no danger of a dermatitis which frequently follows the use of chrysarobin.

ACNE VULGARIS.

As types of dermatoses due entirely, or in part, to pyogenic organisms, acne vulgaris and sycosis vulgaris are well treated by x rays. For acne vulgaris, the x ray is better than any other treatment known. In most cases, but not in all, the eruption can be entirely removed, and in the cases which can not be entirely freed from the eruption, a marked improvement can be secured. About five per cent. of the apparently cured cases will relapse, but the relapse is not severe and responds to a few additional exposures. Under x ray exposures the comedones, papules and pustules disappear, the hyperactive sebaceous glands which furnish the soil for the acne bacillus are checked, the follicular openings are less patent, and the thick heavy oily skin which is the background for acne vulgaris is changed to a skin more nearly normal in those respects.

Pathologically, acne vulgaris is more than a simple inflammation. There is a follicular and perifollicular infiltration with lymphocytes, and through bacterial action a small perifollicular abscess is developed. The changes in the corium are more than a simple inflammation, for surrounding the small purulent focus is a dense mass of granulomatous cells in which are found plasma cells, multinucleated cells or chorioplaques, and connective tissue spindles. From this picture it would be predicted that half unit doses would be most effective, and so they are, and in severe nodular forms of acne that dose is used; but because acne is treated most often on the face, and treatment continued over a period of several months, it is safer to use average doses of one quarter unit of x rays, repeated every seven days. A permanent cure is always tried for, and from ten to fifteen such exposures given. At the same time any hygienic or dietetic changes, indicated by the patient's condition, are instituted.

So effective is x ray treatment of acne vulgaris that there is a tendency to overuse the method, by treating persons who have only a stray papule or two on the face. There is no danger or harm in so treating, but it is not necessary, as these very mild eruptions can be treated satisfactorily by hygienic and dietetic measures alone, or with the very simplest medication. But if the eruption is at all stubborn, or extensive, and especially if pustules or nodules appear with their danger of scarring, x rays are at once indicated.

Sycosis vulgaris, a similar pyogenic infection of hair follicles, presents the same indications as acne vulgaris and is similarly treated. Occasionally a case presents itself which will not yield to fractional doses, but requires the application of sufficient rays to produce a temporary falling of the hairs in the affected areas, after which the disease is found to be cured. This method of temporary depilation by x ray will be discussed under ringworm of the scalp. Before x rays were used, sycosis vulgaris was an exceedingly stubborn and often incurable condition, and x rays have been a blessing to those so infected.

RINGWORM OF THE SCALP.

The dermatological conditions due to fungus growth furnish cases well treated by x rays. Ringworm of the smooth skin is not usually irradiated, as the usual antiseptic treatment is sufficiently effective. Ringworm of the nails, as stubborn a condition as any we meet, will respond to the persistent use of x rays, and excellent cures can be had by raying cases of actinomycosis, blastomycosis and sporotrichosis.

The greatest triumph for x ray therapy in this group of fungus infection is in the cure of ringworm and favus of the scalp. These dermatoses, chronic and readily communicable, presented a most difficult problem before x rays were used. Treatment was conducted by a long painful course of pulling out hairs and rubbing in some strong antiseptic, a laborious and disagreeable treatment to the patient and the attendants, so irksome that most patients would never persist in the treatment and remain uncured and infect others. This painful and tedious method would be persisted in for from six months to two years, during which time the child, for these are children's diseases, could not attend public school.

Today we cure ringworm and favus of the scalp at one sitting, and after six weeks the child returns to school. The method is to produce a temporary alopecia of the entire scalp. The fungus causing these scalp diseases lives almost entirely on the hairs, and to a very small extent, if any, in the epithelium lining the follicles. If, then, all the hairs, with their burden of organisms, are removed at one time, then the small remainder of the process, if any remain, is readily terminated by any mild antiseptic treatment. The amount of x rays used is exactly one skin unit. That amount on a hairy part produces a temporary epilation, with the assurance that the hairs will regrow. The margin of safety between this dose and the erythema dose, which would produce a hopeless, permanent alopecia, is none too wide, not much over thirty-three per cent., but this is ample in the hands of an experienced worker, and the method is today universally employed.

The technic is this: The child's scalp must not have been irritated by strong iodine or chrysarobin ointments for two weeks before treatment, nor after; at treatment the scalp must be free from scales and crusts, and the hair clipped very close to the scalp. The rays are applied at five points: the vertex, the frontal and occipital regions in the midline, and the right and left temporal regions, all of these equidistant from each other so the overlapping of rays will be the same in all areas, and the irregularly shaped scalp uniformly irradiated. One skin unit is given at each point and the rays allowed to spread widely and overlap. After treatment, the scalp is washed daily, and at the end of two weeks, when the hairs begin to loosen and fall, they are carefully removed. The third week finds the child's head completely bald, and at this time a two per cent. ammoniated mercury ointment is rubbed into the scalp daily. After remaining bald for an average of six weeks, the hairs start to regrow, the new growth of hairs is of the same texture and strength as before, and when regrowth is completed, the scalp is found free from infection.

The treatment of ringworm and favus of the bearded portion of the face in men is by the same method of temporary x ray depilation.

HYPERTRICHOSIS.

As soon as it was known that x rays would depilate, the ray was used in attempts to cure hypertrichosis, particularly superfluous hairs on the face of women. Unfortunately the rays cannot be so used, and more harm than good will result from such use. The reason is that a permanent falling of the hairs is required, temporary epilation with subsequent regrowth is not sufficient. Such permanent epilation can be secured, but it requires an erythema dose, one and one half skin units, and applied to the face of a woman, such doses will invariably produce a first degree radiodermatitis, followed after a time by pigmentation, telangiectasis and slight atrophy, a condition more unsightly than was the hypertrichosis. For this reason dermatologists advise against x ray treatment for this condition.

TUBERCULOSIS OF THE SKIN.

Another group is that of the infectious granulomata, in which the pathological process is infiltration with lymphocytes, giant cells, plasma cells and epithelioidal cells, besides new connective tissue spindle cells. This process is quite resistant to x rays and requires fairly large doses repeated many times. An example of this is lupus vulgaris, true tuberculosis of the skin. The Finsen light having proved an impracticable treatment in this country, x ray is the best treatment at our disposal, and will produce cures or marked improvement in over half of all cases of lupus vulgaris, whether favorable or not. The amount of ray used is one half or three quarters of the unit, depending on the clinical type and the age of the patient. This dose is repeated every two or three weeks. To obtain results, this should be persisted in for from six to twelve months. Lesions of any part of the body may be so treated, and tuberculous lesions of the mucous membrane of mouth, nose, and throat may be treated by filtering the rays, thus using only the most penetrating rays, and sending in a correspondingly larger amount through the skin surface above the mucosa lesion. Scrofuloderma, tuberculous adenitis, and tuberculosis orificialis yield in the same manner, and in these types of tuberculosis the prognosis for cure is good.

Other granulomatous diseases of the skin yielding to x rays are blastomycosis, sporotrichosis, and actinomycosis, mentioned before, erythema induratum, mycosis fungoides, leucemia of the skin and others.

BASAL CELL EPITHELIOMA.

Malignant disease of the skin is the last group to be considered, these diseases requiring the largest amounts of x rays given. The type of malignancy of the skin most often treated, and yielding best results, is basal cell epithelioma, or rodent ulcer, the type most commonly seen and relatively benign because it does not involve lymphatics and does not metastasize, though it spreads by extension both laterally and inwardly, and can destroy any tissue it infiltrates. There is no doubt that an adequate dose of x rays will kill epithelioma cells, and this can be done with an amount that will not seriously harm the skin. The records of x ray treatment show that ninety-five per cent. of permanent cures can be had in selected cases, and eighty-five per cent. of cures in unselected cases, the latter class including all cases applying for treatment, even though advanced, neglected or improperly treated.

Those results are as good, if not better, than the results of treatment by surgical excision or any other method in use, and because of such results, x ray treatment of basal cell epithelioma is well established as the method of choice. The special advantages are: First, the facility with which certain localities are reached by rays, such as inner canthus of eyes, nasolabial folds, etc., where excision is difficult. Second, the avoidance of disfigurement which follows excision on the face, and over half of all basal cell epitheliomata occur on the face. Third, with radiation it is simple to treat in addition to the growth, a wide enough margin of apparently normal skin to be sure of killing all lateral extensions of the process. This advantage is clear in treating epitheliomata on the eyelids, about the inner canthus of the eyes, and on the nose, where surgery may at times find it impossible to excise the necessary margin. Finally, there is avoidance of pain, shock, and the dread of operation, and a minimum of scarring and disfigurement.

The technic of treatment is to reach every cancer cell with a full lethal dose, no less. For cutaneous treatment this is from one and one half to two units of unfiltered rays, and this amount must reach the undermost and innermost layers of epithelioma cells, as well as those on the surface. This is the main point to be remembered. X rays are absorbed and their quantity diminished by every layer of cells they traverse, and if one in treating an epithelioma of any thickness calculates to supply two units of x rays at the surface, so much of the rays would be absorbed on passing through the layers of cells that the quantity reaching the lowest levels of the growth would be diminished to much less than the lethal dose, and any quantity less than a lethal dose is likely to stimulate the growth and division of cancer cells. The lowest and deepest layers of the epithelioma are the fastest growing, and the full dose must reach there. If the epithelioma is not thick, the unfiltered rays alone may be depended on. If the lesion is at all thick and bulky, then as much of the mass as is possible should be removed with a curette. This is done under local anesthesia, and does not aim at complete removal, but, by removing the great bulk of malignant tissue, brings to the surface and renders more accessible to the rays the deep layers and lateral extensions of the epithelioma. So the rays reach these layers, where cells are dividing fastest, in undiminished, effective amount.

With or without curettement, one and one half to two units of unfiltered ray is given to the known area of malignancy and to a margin of skin one half inch wide on all sides. After four to six weeks, the same dose is repeated, and again repeated after the same interval, until a clinical cure has been obtained.

If the physical character of the growth is such that the lowest layers cannot be exposed by curettement, and it is evident that unfiltered rays will not be sufficiently penetrating, then the rays are to be filtered through metal, usually three mm. of aluminum, to increase the proportion of deeply acting rays. Filtered radiation is indicated in deeply seated and greatly indurated lesions, and especially if muscle, bone or cartilage is involved. The formula given before for the unit of unfiltered x ray does not hold for filtered radiation.

The cause of failure in treating basal cell epithelioma is, in short, failure to destroy the lowest level of malignant cells. This may result from insufficient dosage, but most often from failure to curette or treat with filtered rays a thick deeply seated growth. Such cases will seem to be cured, but after some months will show relapse. An epithelioma which has been mistreated or inadequately treated by x rays may acquire an immunity against radiation that will make this agent powerless against it. Previous treatment by caustics, cautery or any agent that does not completely remove the malignancy but only irritates it, may make hopeless for radiation a case that should have been favorable.

OTHER TYPES OF SKIN MALIGNANCY.

Prickle cell or squamous cell epithelioma is much more malignant than the basal cell type, as it early involves the lymphatics and sends metastasis to nearby parts. However, this epithelioma always starts as a local growth and in this stage x rays are highly efficient, though the cells of prickle cell epithelioma are inherently more resistant than the cells of the other type. Large doses, two units, must be used, with filtration or curettement to meet the problem stated before. At the same time the lymphatic paths should be rayed even if no extension there can be demonstrated. When metastasis has occurred x ray alone should not be depended on, but surgical eradication of all areas should be done in conjunction with vigorous radiation.

The various types of sarcoma of the skin are rare, and not much experience has accumulated. They seem susceptible to x ray, and are treated like epithelioma of the squamous cell type. The socalled sarcoma of Kaposi is curable by x rays.

Of the preepitheliomatous lesions, the senile and seborrheic keratoses can be eradicated by erythema doses of unfiltered ray. Leucoplakia doses not respond.

MISCELLANEOUS DERMATOSES.

To complete this account of cutaneous therapy, mention should be made that excessive function of skin glands is controllable by x rays, and hyperidrosis and bromidrosis are so treated. The antipruritic effect of x rays leads to their use in treating pruritus ani and pruritus vulvæ. Most of those suffering from these distressing conditions can be quickly relieved of the itching, and some permanently cured. There are other indications for x ray therapy in dermatology, but those considered are the most important and illustrate the principles of treatment.

528 Delaware Avenue.

SEBORRHEAL DERMATITIS

By Samuel Feldman, M. D.,
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The beneficial effect of the rays from the quartz mercury lamp on seborrhal lesions is now generally admitted by dermatologists familiar with its action. As this action is due to actinic rays which occupy the same position in the solar spectrum as the ultraviolet rays of the sun, the beneficial action of sun light in this disease must be conceded. For the original should be at least as effective as its substitute. The same, however, can not be said about the influence of frequent washing and bathing in patients with seborrhea. It can not be said whether it helps its prevention, whether it increases the predisposition to the disease, or whether it influences an established case of seborrhea one way or the other.

The late Dr. Gottheil argued, and some of the men formerly associated with him still hold, that frequent washing of the head is beneficial in preventing this disease. To substantiate this claim, the South Sea Islander is brought forward as an example. These people spend most of their time diving in the ocean, and it is asserted that seborrheal alopecia is unknown among them. This argument would be sufficient, if it could be established that the only difference in the mode of living between the South Sea Islander and civilized mankind is his sea diving occupation and pastime. This, however, is not the case. There is no doubt in the mind of the author that clothing worn by the city dweller, especially the black felt hat which completely prevents the sun rays from reaching and exerting its beneficial influence upon the skin, indirectly predisposes to seborrhea and its accompanying alopecia. For the same reason, seborrhea is unknown among savages who have no use for hats and wear but little clothing on their bodies.

The following case, which I saw in consultation with Dr. J. Landy, on July 11, 1923, confirms me in this belief.

Case.—The patient, a young man, about twenty-eight years of age, stated that for several years he had had a moderate amount of dandruff. He had been spending the entire summer at the seashore and still resided there. His clothing for the greater part of the day consisted of a dark colored bathing suit. About ten days prior to the date on which I saw him, an extremely itching eruption had developed.

On examination the patient presented a unique and striking picture. The entire torso, front, back, and sides, also the uppermost portion of the thighs, were covered with brownish red patches of seborrheal dermatitis. Some of the patches were covered with muddy yellow and greasy scales. The eruption was strictly limited to the portion of the body covered with the bathing suit. It ended in a sharp margin exactly where the edge of the bathing suit came. The line of demarcation was still further enhanced by the deep tanning of the exposed portions of the body, where not the slightest evidence of any lesions could be found.

The conclusions drawn from this case are:

1. That the sun rays prevented the disease from appearing on the exposed portions of the body.
2. That the frequent salt water bathing had no beneficial effect, and possibly the opposite was true.
3. That the frequency of seborrheal alopecia in civilized men and its absence in the savage was due to the clothing the former wears.
4. That this disease was more common in men than in women because the former was more thoroughly covered.

1955 Grand Concourse.

AN UNUSUAL CASE OF PURPURA

By Louis H. Sigler, M. D.,
Brooklyn, N. Y.

Purpura may be conveniently divided into two groups, one in which it is a symptom accompanying many definite diseases, the other in which it occurs independent of any known disease. In the latter group we have the pure hemorrhagic form—where all the associated systoms are dependent upon bleeding or the loss of blood—and the socalled rheumatic form, in which, associated with the bleeding, there are some arthritic or rheumatic manifestations.

The substitution of the term rheumatic for the usual textbook term arthritic I think is justifiable. There are many cases on record which can not be fitted in or considered as simple purpura, Schonlein's disease or Henoch's purpura, for lack of definite joint symptoms, and yet can not be classed as hemorrhagic purpura for the presence of various muscular or other vague aches or pains, which for lack of better knowledge, are classed as rheumatic manifestations.

In this subgroup of purpura may perhaps be placed the following case which we recently observed in the Williamsburgh Hospital:

Case.—S. R., fifty years of age, Russian Hebrew, male, married, occupation baker, was admitted August 4, 1922, with complaints of severe swelling of right chest and left upper thigh. These swellings began to develop on August 3 and gradually grew larger. The condition apparently came on suddenly without any warning signs or premonitory symptoms. He stated, however, that about one month previous to onset he had severe neuralgic pains in the right arm and right side of chest which lasted about two days, but disappeared never to come back.

In his family history nothing abnormal was mentioned, while his past personal history was that of a fairly normal person. He never had any bleeding, nor were there any bleeders in his family. He never suffered from any of the infectious or contagious diseases. He had a productive cough and occasional night sweats within the past year, but there was no loss of weight, no weakness, hemoptysis, fever, dyspnea or palpitation. Appetite was always fair. He never suffered from nausea or vomiting, never had melena, hematemesis or jaundice. He never suffered from any genitourinary symptoms and denied luetic or Neisserian infections. Sexual functions were normal. He has eight children, all of whom are healthy, except one, who for the past eight months, has been suffering from an affection which according to his description would correspond to tuberculous pleurisy. I had no opportunity of seeing that case. He always lived under unhygienic conditions, during the day working in a dark cellar as baker and at night living in dingy, poorly ventilated rooms. His habits were always fairly normal, except that he indulged in excessive tobacco smoking, using twenty to thirty cigarettes a day. He never indulged in alcohol, and always lived on a well rationed diet.

The physical examination on day of admission showed a male of about forty-five years of age, emaciated, cachectic and moderately anaemic. Cheeks were drawn in and bony parts of face stood out prominently. He had anxious gaze and appeared to have little pain. Head did not show any marks of injury or abnormality. Eyes were normal, pupils of equal size, moderately contracted, and reacted to light and accommodation. Mouth had many false teeth and his own few teeth were poorly kept. Gums were not spongy and, except for a little pyorrhea, were of normal appearance.. Chest had marked massive swelling over the entire right axilla, right anterior and right posterior portions, covering an area extending from the apex of the axilla down to the seventh rib and from right sternocostal junction anteriorly to right spine posteriorly, and displacing the scapula upwards. Mass was tense, somewhat tender and fluctuating. The color was somewhat darker than the normal adjacent skin. An estimation of the approximate size of the right side of the chest as compared to the normal left side, was eight inches more. In other words, placing the normal circumference of his chest at thirty-two inches, in this case it was about forty inches, the right side being twenty-four inches and the left sixteen inches. An approximate amount of fluid this mass should have contained can be placed at one quart. The left chest was normal in appearance. No abnormal signs could be detected revealing any pathology within the chest. Abdominal findings were entirely negative. Spleen was not palpable. Extremities were normal in appearance except that over the left upper thigh, extending from Poupart's ligament down to about three inches above the kneejoint, in its inner part, there was a swelling similar in appearance to that of the chest, but of smaller size.

Outside of these two masses there was absolutely not a typical purpuric spot to be found, and applying the turniquet test we could not produce any such spots. X ray revealed no pathology other than the infiltration of overlying soft parts.

Throughout his stay in the hospital of two weeks, there was little change in sizes of both masses, but the consistency and color changed materially. The first seven days the consistency was fluid, as shown by fluctuation, and gradually became more solid. Aspiration on the first day yielded clear, uncoagulated arterial blood, while ten days later aspiration yielded nothing, and tumor felt solid. Color likewise underwent gradual change from slightly darkened hue on the first day to blue color three days later, yellowish blue at the end of ten days and brownish yellow on the day he left the hospital—all of which are typical blood changes in ecchymosis. Discoloration of chest extended down to the pelvis, covering right abdomen and flank.

His general condition was grave the first seven days. He seemed to have suffered greatly from the loss of blood. He was very weak, had headaches and occasional dyspnea. He coughed frequently, was restless and slept poorly. His temperature varied from 99 to 100 degrees, pulse 70 to 100 and respiration 20 to 30.

The urine was entirely negative on two different days. Blood count on the second day showed red blood cells 4,350,000, white blood cells 9,200, hemoglobin 85 per cent., differential count normal. On fourth day the white blood cell count was 13,000 with a differential of 76 per cent. polymorphonuclears, ten per cent. small mononuclears, twelve per cent. large mononuclears, and two per cent. eosinophiles. On the ninth day, the red cell count was 3,340,000, the white cell 10,500, with a differential of 70 per cent. polymorphonuclears, ten per cent. small mononuclears, twelve per cent. large mononuclears, and 3 per cent. eosinophiles. The blood platelet count on sixth day was 430,000 and coagulation time was four minutes. Feces was negative to parasites, mucus or blood. Tuberculous fixation test was positive and Wassermann test negative.

Twelve days after admission, the general condition markedly improved, and the patient, insisting upon going home, was discharged at end of two weeks. I saw him three days later and again about four weeks after his discharge. At that time, both masses had entirely disappeared under potassium iodide treatment. Generally, he was in much better condition which may be accounted for by the fact that he changed his occupation from baker to that of peddler on the street. He complained, however, of weakness and occasional pain in right arm. Physical examination then revealed some râles at both apices posteriorly with signs of partial consolidation in the same areas. There were also some râles heard at left lower base posteriorly.

The outstanding features in this case were:

Localization of subcutaneous hemorrhage to only two superficial parts of body, involving fairly large blood vessels. Absolutely no bleeding from any of the mucous surfaces. No typical intracutaneous hemorrhage, exhibiting itself in form of purpuric spots, and none could be produced mechanically. No history of hemophilia. Normal blood platelet count, but some increase in white cell count with relative increase in large mononuclears, some of which might have actually been bone marrow cells. Delayed coagulation and deficient contractility of blood clot within the body for several days, while the laboratory coagulation time was approximately normal. Complete absorption of both masses and recovery of patient with no sequelæ (except slight pain and weakness of right arm) and no recurrence of condition at present writing. Evidence of inactive pulmonary tuberculosis.

With these findings before us, the questions arise: Are we dealing with a case of purpura? If so, what form is it and what is its etiology?

That it is a case of purpura is evidenced by: 1, long delayed coagulation time and deficient contractility of blood clot, while laboratory coagulation time was normal; 2, by relative increase in large mononuclears, some of which might have been bone marrow cells; 3, by exclusion of all other possible conditions that might give rise to such bleeding. Thus, trauma is excluded by history; malignancy is excluded by negative x ray findings and by condition clearing up; pulmonary tuberculosis with intrathoracic erosion of a blood vessel and hemorrhage finding its way outwards, is excluded by the presence of a similar bleeding in the lower extremity; ruptured varicose veins is excluded by location, lack of varicosities and by blood being arterial; ruptured aneurism is excluded by negative Wassermann, negative physical findings and by complete disappearance of ecchymosis.

As to what form of purpura this is, it is hard to tell. It can not, strictly speaking, be considered as hemorrhagic purpura, not having been accompanied by hemorrhage from any of the mucous membranes, and having run such a mild course with complete recovery. It can not be placed among Henoch's purpura and Schonlein's disease. A good name would be simple hematomatous purpura—simple, for its uncomplicated course and hematomatous, to designate the extent of bleeding.

The etiology of this form of purpura, like that of any other form, is obscure. To say that poor hygienic surroundings, excessive smoking, debility and possibly latent tuberculosis that we found in this case, are the causes of this disease is not correct. Most persons that we find under the same conditions do not show this disease. We can also rule out heredity, unbalanced and poor diet, and idiosyncrasy. We thus come down to some unknown infection or toxin, or most probably, mixed infections or toxins as being the possible causes of this and all other forms of purpura. The infections or toxins attack either the blood forming organs, modifying the composition of the blood, or the vasomotor system or the blood vessel wall itself. In some forms all parts are equally attacked, in others, some are spared.

Dermatological Therapy.—Veyrières (*Bulletin médical,* October 6, 1923) asserts that poor results from external remedies in skin diseases are often due to improper formulation of the preparations prescribed, and criticizes various formulæ in use at the Saint Louis Hospital, Paris.

Petrolatum, while it does not become rancid, is disadvantageous in that its solvent powers are practically limited to iodine and the phenols; it does not penetrate the epidermis, and therefore does not assist the penetration of substances incorporated in it; above all, its melting point is too low, so that ointments made with it fuse, and spread over the skin surface or are absorbed by dressings, thus removing the incorporated drugs from contact with the skin. This defect can be obviated by incorporating in the petrolatum a considerable amount of paraffin.

Cerates and cold cream form better excipients and penetrate the cells of the horny layer. Even these products are somewhat too soft, especially in the summer; this is corrected by increasing the customary amount of wax, or better, by adding one fifteenth or one tenth part of wool fat. To prevent rancidity of cold cream or cerate, all or part of the aromatic waters used in their preparation may be replaced by lime water, the calcium of which saturates the fatty acids in the preparation as fast as they are formed. Lime water can be incorporated in lard by first absorbing the former with lanolin and then mixing the latter with the lard. Bismuth and zinc oxide in sufficient amounts will also saturate the fatty acids.

A three per cent. ointment of salicylic acid in petrolatum is not at all likely to be active because salicylic acid is not dissolved in the excipient. The acid will dissolve in oil, which can then be thickened with wax or stearin, but this will never yield a preparation stronger than three per cent. For a stronger preparation it is best to make a twenty per cent. solution of salicylic acid in water to which boric acid has been added, absorb this solution with lanolin, and incorporate the latter with the main ointment base. One part of iodine in fifty parts of petrolatum makes a very satisfactory ointment; a three per cent. ointment is also feasible.

For a sulphur lotion, the author endorses Huerre's formula: precipitated sulphur, 7.5 parts; powdered soap, three; glycerin, eight; alcohol, eight, and distilled water, fifty. In prescribing oil of cade, glycerin preparations should be replaced by cerates, that is, oil of cade thickened by addition of yellow wax. A strong preparation can be made with only one third or one fourth of the formula consisting of wax; if desired, the oil of cade can be diluted with some vegetable oil.

If a preparation which can be more easily removed from the skin with water is desired, some lanolin can be added to the cerate; for a relatively weak action, one part of oil of cade to two parts of lanolin may be used. An excellent preparation, easily removed with water, and containing a maximum of forty per cent. of oil of cade, is made by saponifying the oil with one centigram of saponin per gram of oil, and the yolk of one egg, this being then incorporated in lanolin.

Abstracts from Current Literature

DERMATOLOGY.

A Suggested Etiology of Bakers' Dermatitis.—Oscar de Jong (*Lancet,* May 5, 1923) believes that salt may be justifiably regarded as the direct cause of the condition, but the patient must display an idiosyncrasy for the salt, as the condition is not found in all bakers. It is interesting to note that dermatitis also occurs in other people who are habitually engaged in the handling of salt, such as herring salters, packers, and rock salt workers. The important fact remains that a person can be cured under very simple treatment on being removed from his work if there are no secondary symptoms, but that a relapse will occur when he returns to work. A prophylactic measure is the provision of running fresh water under which the man might rinse his arms from time to time.

Influence of Intravenous Injections of Mercury Benzoate on Wassermann Reaction.—Strickler (*Journal of Laboratory and Clinical Medicine,* April, 1923) selected twelve patients suffering from various skin conditions, especially the chronic dermatoses, giving them mercury benzoate intravenously at weekly intervals, varying the dose from two fifths to three fifths of a grain. Eleven patients had a negative Wassermann before these treatments, and one a four plus at the beginning, which was unaltered after twenty mercurial injections. In nine of the patients the Wassermann reaction remained negative. In one instance it became doubtful after the twenty-second injection, and negative after the twenty-ninth. Another patient with an acute psoriasis of nine months' duration in whom the Wassermann was negative before treatment developed a four plus reaction after the twelfth injection, which persisted after the eighteenth, when the patient disappeared. The author does not believe that the Wassermann reaction is influenced by the intravenous use of the mercurials.

Socalled Dermatitis Exfoliativa.—After studying an epidemic in a children's hospital, E. Wieland (*Schweizerische medizinische Wochenschrift,* December 21, 1922) came to the conclusion that there is only a gradual difference between pemphigus contagiosus and dermatitis exfoliativa. In every one of the author's twelve cases, the Staphylococcus pyogenes aureus was present. The infection originated in a girl who was affected with a panaritium and who laundered the diapers.

The treatment is strictly antiseptic. Isolation of the patient is always indicated, inasmuch as the contagion spreads by contact infection. The prophylaxis requires the most careful asepsis. The individual vesicles and blebs must be opened aseptically at once and the blebs must be thoroughly dried by complete removal of the covering skin and by the absorption of the infectious content by sterile cotton sponges in such a manner as to avoid contamination of the surrounding skin (autoinoculation). The moist, red base of the vesicle should be moistened either with alcohol or a three per cent. solution of silver nitrate, or touched lightly with a stick of silver nitrate. An antiseptic powder (dermatol) is then applied as thickly as possible. This treatment is repeated as soon as a fresh vesicle appears, at least two to three times a day. An antiseptic bath may precede the opening of the vesicles. The healthy skin should be kept dry with powder. Small pustules or folliculitides should be ruptured with alcohol sponges and treated with tincture of iodine or incised. Those portions of the skin which have folds, or are exposed to trauma, and those around the mouth and nose require particular attention. In severe forms the bath and salve treatments are contraindicated; the child should be kept naked and merely wrapped in sterile gauze.

Röntgen Ray Treatment of Skin Diseases.—Clyde K. Hasley (*Medical Clinics of North America,* March, 1923) says that the rays of a long wave length are especially indicated in the treatment of superficial dermatoses. The therapeutic effect is apparently due to the absorption of rays by the tissues through which they pass. The various wave lengths differ in their ability to penetrate tissues of the body. For superficial skin lesions the question of penetration is not as important as the question of dose, but for deep therapy improper penetration, with imperfect depth dosage in consequence, results in disappointing failures. The method employed was, in the main, that taught by Zwawulenberg, excepting the use of a longer spark gap, higher milliamperage and usually a filter. Mycelial dermatitis, senile keratoses, and other squamous eruptions yield more promptly to the unfiltered than to the filtered rays. The aluminum screen enables us to give longer exposures and diminishes the chance of producing a burn by filtering out the soft rays which act so readily on the skin. In the hands of a novice filtered rays are much safer than the unfiltered. Röntgen rays, properly applied, are the most useful single therapeutic agent in the hands of the dermatologist.

Hypersusceptibility in Constitutional Eczema of Infants.—E. Gartje (*Monatsschrift für Kinderheilkunde,* April, 1923) asserts that there is a group of children who are affected with constitutional eczema and who show a hypersusceptibility of the skin toward fats, which is expressed in the eczema. These children are characterized by thinness, a dry eczema, and are usually free from other exudative phenomena. Fatty food or the administration of fat aggravates the eczema, and the exclusion of fat causes it to recede or to disappear entirely. Codliver oil acts in the same manner in this respect. The author believes in the theory that milk fat is the etiological factor responsible in these cases and would therefore exclude all fat from the diet, with the reservation that this applies only to the group of constitutional eczema. Inasmuch as injections of butter and oil seem to lessen the hypersusceptibility of the skin, a certain therapeutic significance may be attached to the intracutaneous injections of solutions of fat in obstinate cases.

SURGERY.

Curettage of the Conjunctiva in Chronic Catarrhal Conjunctivitis.—Nikolaus Blatt (*Wiener klinische Wochenschrift,* December 28, 1922) states that the curettage of the conjunctiva is indicated in all cases of chronic catarrhal conjunctivitis which persist in being refractory toward all the other methods of treatment. The technic is the same as in trachoma: with the aid of a scalpel or a small curette, constructed along lines similar to the instrument used for gynecological purposes, the epithelium is energetically scraped off everywhere. In this procedure, the lids must be pressed against a hard object in order to reach the subepithelial tissue superficially.

Prognosis of Luxations of the Shoulder.—Hans Gubler (*Schweizerische medizinische Wochenschrift,* September 28 and October 5, 1922) comes to the conclusion that the prognosis of simple uncomplicated luxation of the shoulder is good and that the period of cure is an average of thirty-eight days. The prognosis is dependent upon the age of the patient: the older the patient the longer does it take to heal and the greater the percentage of invalidism. The prognosis of right sided cases of shoulder luxation he found somewhat poorer than that of the left sided cases. Unskilled laborers required a longer period of healing than able and intellectual mechanics. The prognosis of uncomplicated shoulder luxation may be improved from the beginning if motion therapy is begun from the very first day after the reduction. The prognosis of complicated shoulder luxations is, a priori, poorer. It depends, most of all, upon the nature of the complication. The worst prognois is observed in luxations with paralyses of nerves, both as to the period of cure and as to invalidism. The cases complicated by fracture of the greater tuberosity show an average period of healing of eighty-two days and an invalidism of seventeen per cent. Of all complicated luxations, only seventy per cent. heal without a permanent injury. The prognosis of habitual luxations is poor because of the danger of recurrences; no method of treatment that promises success has as yet been found.

Indications for Schede's Operation in Empyema.—Makato Saito (*Mitteilungen aus der medizinischen Fakultät zu Tokyo*) does a resection of the eighth or ninth rib and inserts a rubber tube into the thoracic cavity and irrigates it. By irrigating and measuring the capacity of the empyemic cavity with warm water, the changes in the capacity of this cavity are determined. These changes in the capacity are represented graphically by making the time the abscissa and the capacity of the cavity the ordinate. The point of crossing of these two factors forms a curve, which is called the curve of capacity of the empyemic cavity. This curve is useful, 1, in determining the healing of the empyema; 2, in determining the indication for Schede's operation; and 3, in judging the result of the various forms of treatment. Röntgenography is essential in placing of the indication for Schede's operation. In the treatment of empyema after the thoracotomy, the treatment with Perthes's apparatus is absolutely necessary in order to avoid a chronic empyema.

Use of Large Reverdin Grafts in the Healing of Chronic Osteomyelitis.—Mont R. Reid (*Bulletin of the Johns Hopkins Hospital,* November, 1922) describes a method for treating certain bone cavities remaining after operation for chronic osteomyelitis. It consists essentially of epithelializing the walls of bone cavities by the use of large Reverdin or pinch grafts. The technic of skin grafting is as follows: The bone cavity is treated with Dakin's solution until it becomes lined with clean firm granulations. Without the use of Dakin's or some other antiseptic solution the granulation tissue becomes edematous or "seaweedy," and forms an unhealthy base for the growth of grafts. Two hours after the last irrigation with Dakin's solution large thick pinch grafts, half a centimetre in diameter, are placed closely together upon the surface of the cavity. The grafted wound is then exposed to the air for from six to eight hours. This short drying period serves to fix the grafts firmly to the granulation tissue. The grafts are then covered and held in place with a single layer of gauze which is firmly secured to the normal skin so that the moistening and changing of saline compresses during the next two days will not displace the grafts. After two days the grafts have taken and the use of Dakin's solution instead of salt solution is begun. This is applied by laying wet compresses directly against the wound (the thin layer of protecting gauze having been removed) every two hours during the day and every four hours at night. After about five days the Dakin's solution is discontinued and the wound is dressed with rubber "protective" or old linen. Invariably the grafts grow quickly and cover the granulation tissue with epithelium in from ten days to two weeks. Should the granulations become high (usually from the edema of infection) caustics should not be used; Dakin's solution reapplied for one or two days will reduce the swollen granulations to the level of the grafts, and will not injure the growth of new skin. With such a method of treating chronic osteomyelitic bone cavities the time required for curing the most stubborn cases is usually from four to six weeks.

Closure of Granulating Wounds with Reverdin-Halsted Grafts.—Karl Schlaepfer (*Bulletin of the Johns Hopkins Hospital,* April, 1923) describes the technic of the Reverdin-Halsted grafts which is the method of choice at the Johns Hopkins Hospital in treating defects following extensive laceration of the soft parts with secondary necrosis and suppuration, the grooves resulting from sequestrotomy for chronic osteomyelitis, and some cases with granulating areas following unsuccessful plastic operations for empyema. The method has also proved useful in the treatment of x ray burns and of trophic nonspecific ulcers of long standing which have been refractory to all other measures. In every case a smear must be made from the wound to determine its bacteriological condition. Dakin's solution is used in the preliminary treatment until relative sterility is obtained, when the grafting with small deep grafts is done. Schlaepfer states that every infected wound not suitable for secondary closure can be successfully covered with a very resistant, elastic skin by means of the Reverdin-Halsted transplantation.

Experimental Surgery of the Thoracic Esophagus.—Robert T. Miller, Jr., and W. D. W. Andrus (*Bulletin of the Johns Hopkins Hospital,* April, 1923) report work on dogs which demonstrates that a suture of the esophagus can be made so as to hold securely and to result in satisfactory healing, an intact functioning anastomosis being obtained in eleven animals. It also demonstrates a fairly satisfactory substitute for at least the lower two thirds of the tube, and the presence of a well developed submucosa in the human esophagus. The surgical method is described in detail. The futility of the present management of cancer of the thoracic esophagus would seem sufficient justification for undertaking promising procedures, even though they involved a greater risk than one would willingly assume.

Tuberculosis of the Sacroiliac Joint.—H. C. Wardleworth Nuttall (*Lancet,* April 28, 1923) believes that the old operations of trephining and scraping are not based on sound conceptions of the anatomy and pathology of the joint; also that the results of these operations are poor according to his experience. Much better results are to be expected from the more radical treatment, such as Picque's method, which is as follows: 1, approaching the joint by cutting away the posterior overlapping portion of the ilium; 2, the resection of more or less of the sacrum, as may be necessary, for the complete evacuation of any intrapelvic abscess; 3, the methodical following up of the disease by means of the gouge or curette, so that a smooth granulating surface may be formed without pockets or sinuses.

Treatment of Clavicle Fractured by Indirect Violence.—Frank Romer (*Lancet,* May 5, 1923) asserts that treatment depends upon the control of the outer fragment by means of the intermediary, the scapula. In order to reduce the deformity he raises the arm on the injured side to a right angle with the body, thereby bringing the outer fragment up to the level of the inner fragment. The patient's both shoulders are then firmly drawn back, so that the scapula is pushed back as far as possible, the arm being kept raised at a right angle. Having effected reduction of the deformity in this manner, apposition of the fragments is secured by fixing of the scapula in the position in which it now lies by placing a thin layer of gamgee tissue or cotton wool in the axilla, fixing a long strip of adhesive plaster to the top of the shoulder joint just over the acromion and bringing it up under the axilla to the front where it crosses over the top of the shoulder at the acromial end of the clavicle. This strip, which encircles the shoulder joint, is brought diagonally across the scapula to below its angle. A second strip of plaster, about one and a half inches wide, is attached just above the nipple and brought with firm pressure over the clavicle to below the angle of the scapula. A third and a fourth piece are then applied in the same way, slightly overlapping each other, and covering the entire surface of the clavicle. The arm is then gently lowered and the patient is allowed to dress himself in the ordinary way. The only support necessary is an ordinary sling, which is worn for the first two days. The use of the arm should be restricted to underhand movements. Skilled massage is applied daily for at least a week. After ten days the sling is discarded and the arm be put to general use. The strapping should be renewed after four days and again as may be necessary for at least three weeks.

Open Ether for the Occasional Anesthetist.—Among the advantages of the open ether method of administration, over the old ether cone method mentioned by Arthur Waters (*Lancet,* April 28, 1923) are: 1, an efficient apparatus can be made in half an hour; 2, the mask being warm and damp at the start, the inhaled vapor tends to irritate the mucous membranes to a minimum degree; 3, the patient's forehead and eyes are uncovered and easy of inspection; 4, going under is infinitely less disagreeable to the patient than the method so often adopted in which the whole face is covered with cotton wool and a low mask upon which ether is slopped promiscuously. The felt masks are best cleansed by careful washing, followed by a soak in 1:40 carbolic solution. Too much boiling causes them to shrink very rapidly and to become hard. The shrunken masks may be used for children.

Treatment of the Internal Derangements of the Knee Joint. A New Method of Operative Exposure.—A. G. Timbrell Fisher (*Lancet,* May 12, 1923) secures adequate exposure of the knee joint by making a slightly curved incision, commencing above in the median line, an inch above the uppermost limits of the suprapatellar pouch, skirts the inner border of the ligamentum patellæ and of the patella and ending below slightly to the inner side of the tubercle of the tibia. The flap of skin and subcutaneous tissues is reflected outward to slightly beyond the outer border of the patella. The patella is dislocated to the outer side of the joint, and on further flexion of the joint an excellent exposure of the whole of the anterior compartment is obtained. This procedure obviates the introduction of the finger into the joint as every part of the joint is exposed to view.

Treatment of Acute Suppurative Infections of the Hand.—John R. Griffith (*Clinical Journal,* September 5, 1923) deals with infections of the finger pulp, the nail bed, the midpalmar space, the thenar space, the fascial space in the forearm, and the tendon sheaths.

There are a few important points in the technic of these operations. The field must be bloodless, in order to enable one to see where the pus is coming from and to follow it up. A tourniquet is, therefore, always used, and the best form of tourniquet is a blood pressure apparatus round the upper arm; it can be easily controlled by the anesthetist. It is essential to avoid injuring nerves, therefore the method of opening up the deeper tissues described by Hilton is invariably used. Drainage tubes should never be used; gauze ribbon soaked in liquid paraffin is sometimes used for draining tissue spaces. No foreign body should ever be left in a tendon sheath; it enormously increases the risk of necrosis of the tendons.

With regard to aftertreatment, early mobilization is of the utmost importance. Within twelve hours of the operation the patient is given a warm two per cent. saline bath and encouraged to move his fingers in it. Bleeding, of course, does take place, but not to a serious extent, and it has the advantage of relieving congestion. The baths are repeated twice a day until the suppuration shows signs of cleaning up. After each bath the patient washes his hands with soap and water; this relieves to some extent the extraordinarily uncomfortable feeling that follows a prolonged bath, and it also necessitates some degree of mobilization. If the incision is adequate, mobilization does not spread the infection. Later, when the discharge becomes serous, mobilization under radiant heat is of great value.

PEDIATRICS.

Occurrence of d'Herelle's Bacteriophages in the Stools of Infants.—Ludwig Surányi and Eugen Kramár (*Monatsschrift für Kinderheilkunde,* July, 1923) found that of the fifty filtrates of stools of infants tested, twenty-three showed a pronounced lytic effect (forty-six per cent.) The highly valent lysins originate, generally, from infants in the second half of the first year of life. The condition of the intestinal tract appears to be of some significance: of the twenty-three strains of bacteriophages, nineteen were derived from infants with healthy intestines and therefore normal stools contain the lytic agent decidedly more often than dyspeptic infants. The constitution seems to have an effect in so far as bacteriophages are found in infants with the exudative diathesis much more rarely than in healthy infants (14.2 per cent. in exudative diathesis, 56.7 per cent. in healthy infants). The occurrence of the bacteriophages does not depend upon the nature of the food. All the stool filtrates were tested against fifty-two strains of eight varieties of bacteria. There seems to be a certain regularity in the manner in which the various highly valent bacteriophages behave toward the diverse strains of bacteria. In the first place, the toxic strains of dysentery were attacked by the highly valent bacteriophages. In a more extended field of action, in the second place, are the strains of the atoxic dysentery group, then come the colon bacilli, and the members of the typhoid group come up for consideration only exceptionally.

Treatment of Infantile Scurvy.—The chief sources of the antiscorbutic factor or vitamine C are green, leafy vegetables, roots, tubers and fruits, although they vary greatly in richness of content while animal products contain relatively little. J. C. Gittings (*Archives of Pediatrics,* August, 1923) recommends in the treatment of frank scurvy in an infant, the free use of orange juice, from two to four ounces a day, diluted with water and in divided doses, as practically a specific. In the majority of cases improvement can be expected within forty-eight hours and a complete cure in two to three weeks. The results obtained with the juice of oranges obtained late in the summer are not always so prompt as with that of the oranges of the new fall crop. Failures in response may be attributed to severe gastroenteritis or secondary infections. If orange juice causes vomiting or fermentation, it may be added to double its amount of boiling water, cooled immediately and alkalinized by a pinch of bicarbonate of soda just before giving. Next in value to orange juice for infants is the strained juice of canned tomatoes, from four to eight ounces a day in divided doses. Even without other dietary changes, such measures are usually curative, but it is well to substitute raw milk for cooked milk in the formula, if the state of the digestion permits. Strained vegetable soup containing potatoes, onions and spinach may also be given. In the rare event of failure, in spite of these changes, freshly alkalinized diluted lemon juice in divided doses, two to three ounces a day, may be given. During the acute stage, when tenderness is marked, the handling of the child should be reduced to a minimum. In very severe cases, wet applications of a solution of magnesium sulphate applied over the swellings are soothing. The milk formula should be weakened and skimmed milk used in place of whole milk, where there is much indigestion or vomiting.

For the prevention of scurvy, human milk is almost a specific. Whenever it becomes necessary to feed milk which has been boiled or pasteurized, some form of antiscorbutic food must be employed, such as strained orange juice or strained canned tomato juice. A baby of four or five weeks can be given half a teaspoonful of orange juice twice a day diluted with water and slightly sweetened if necessary. This amount can be increased to a dessertspoonful twice a day, by the tenth to the twelfth week. The latter amount is sufficient as a routine antiscorbutic. If it disagrees, it may be scalded and alkalinized, as described. Tomato juice may be used in double the quantity of the orange juice. Another cheap substitute for orange juice is swede juice, obtained by scraping and pressing the raw vegetable. When strained, it can be fed in the same amounts as tomato juice. By the sixth month strained vegetable soup may be added to the diet, and with such safeguards, all danger of scurvy is obviated.

Secondary Anemia in Infancy.—Helen M. M. Mackey (*Lancet,* July 28, 1923) states that there is a general consensus of opinion that too prolonged and too exclusive a milk dietary produces anemia in infants and young children. This is probably due in part at least to iron starvation, on account of the low iron content of milk. Some writers, however, have held that it is directly connected with a toxic effect resulting from excessive milk consumption. Premature infants are known to be particularly prone to this form of anemia. In a group of thirty-six artificially fed infants, receiving milk or milk and carbohydrate diets, with or without codliver oil, anemia developed in the majority. It was usually noted toward the end of the first year of life, but sometimes appeared as early as the seventh month. Addition of vegetables to the diet at six or seven months did not prevent anemia. The infants were in well lighted and well ventilated wards, and were much out of doors in summer but very little in winter. Treatment by the administration of inorganic iron salts by mouth brought about improvement in the majority of cases treated, but not in all, possibly because the treatment was not continued for a sufficient length of time. No improvement was noted in the hemoglobin content of the blood in any case within three or four weeks from the beginning of treatment, and improvement might be delayed for six weeks with, thereafter, rapid proggress. It is suggested that many cases of anemia in infants, particularly in those artificially fed from an early age, are probably associated with iron starvation, more especially as it has been experimentally demonstrated that the iron rentention of an infant on cow's or goat's milk is much lower than on human milk.

Treatment of Active Infantile Tetany With Radiations from the Mercury Vapor Quartz Lamp.—Horton Casparis and Benjamin Kramer (*Bulletin of the Johns Hopkins Hospital,* July, 1923) exposed five children suffering from active tetany to the rays of the mercury vapor quartz lamp. Following raying, the clinical manifestations of tetany disappeared in from three to seven days, and the calcium concentration of the serum increased approximately to the normal. The inorganic phosphorus concentration of the serum was also raised to the normal level or above. The treatment, therefore, not only causes the subsidence of the manifestations of active tetany, but also cures the accompanying rickets. The effects of the rays were just as striking with negro children as with white.

Study of Hydrocele in the Nursling.—R. Vaglio (*Pediatria,* September 15, 1923) finds that a remarkable number of cases show the coexistence of congenital syphilis. Contrary to the view of Marfan he does not believe that unilateral hydrocele is always the type present in the luetic cases. The existence of a unilateral or bilateral nonreducible hydrocele should prompt a careful research as to the presence of lues. The rare cases of communicating hydrocele seem to have no connection with hereditary lues; tuberculosis seems to play no part in the etiology of hydrocele in the infant.

Intermittent Duodenal Obstruction in Children.—H. Olding Foucar (*Medical Clinics of North America,* July, 1923) reports two unusual cases of intermittent duodenal obstruction in children. In one, the obstruction was actually demonstrated to be due to an old adhesive fetal peritonitis, resulting in recurrent volvulus of the small intestines with closure of the duodenum. In the other, the obstruction was not demonstrated, but it was assumed from the case history that it was in the duodenum, and seemed to be due to the thickened edematous mesentery preventing free movement of the intestines within the abdominal cavity.

Empyema in the First Two Years of Life.—Hector Charles Cameron and A. A. Osman (*Lancet,* June 2, 1923) arrive at the following conclusions: 1. The high mortality of empyema in the first two years of life is due to the specific character of acute primary pneumonia of infancy. 2. In metapneumonic cases the patients almost always recover; in synpneumonic cases, they almost always die. 3. All metapneumonic cases should be dealt with by excision of rib as speedily as possible. 4. Synpneumonic cases should not be dealt with by excision of rib until after the termination of the pneumonic process; some form of paracentesis should be practised as a temporary measure. 5. In synpneumonic cases death occurs from the original pneumonia and from metastasis of infection to other parts, rather than from the empyema.

Pathogenensis of Rickets.—Eric Pritchard (*British Medical Journal,* May 26, 1923) asserts that the essential basis, or the *causa vera,* of rickets is most probably a relative excess of acid bodies produced in the system by a disproportion between the intake and the output of energy—a condition which results either from an innate inefficiency of the body machine itself, or from defects in the environment, the latter being regarded as including the quantity and the quality of the food, and the stimuli afforded by hygienic surroundings.

Action of Atropine and Pilocarpine on the Motility of the Stomach of Children.—M. Löwy and O. Tezner (*Monatsschrift für Kinderheilkunde,* July, 1923) found that if given in sufficiently high doses (up to two mg.), the subcutaneous administration of atropine leads to a retardation of the emptying of the stomach in children six to fourteen years of age. This retardation is probably due mostly to the diminution of the peristalsis and the tonus; furthermore, the permanent bulb occurs frequently. The general symptoms are slight and do not run parallel with the effect on the stomach. Pilocarpine, likewise, leads to a retardation of the time of emptying in fifty per cent. of the cases, probably as a result of the occurrence of spasms in the region of the pylorus and incoordinated peristaltic movements. The general effect is quite marked and shows a certain relationship to the condition of the stomach at rest. The differentiation of vagotonic types is impossible and age has no effect upon the action of atropine and pilocarpine upon the stomach.

Stridor and Dyspnea in Childhood.—Jesse B. Naftzger (*Journal of the Iowa State Medical Society,* September, 1923) classifies the causes as: 1, nervous disorders; 2, causes extrinsic to the larynx and trachea; 3, intrinsic causes. Nervous disorders comprise laryngismus stridulus and spasmodic croup, tetany and bilateral laryngeal paralysis. Extrinsic causes are enlarged mediastinal or cervical glands, enlarged thymus, retropharyngeal abscess, injuries, and foreign bodies in the hypopharynx and esophagus. Intrinsic causes are congenital stridor, new growths, stenosis from scars and burns, foreign bodies, acute inflammation and infections with or without membranous formation.

Cutaneous Tuberculin Test in Advanced Tuberculosis in Childhood.—Charles McNeil (*British Medical Journal,* April 21, 1923) makes certain modifications in the technic and reading of the Pirquet test, by means of which a positive reaction is obtained in the severe forms of tuberculosis, in which the diagnosis is verified by the finding of the tubercle bacillus and necropsy. A small area of the skin on the flexor surface of the forearm is chafed with the sharp point of a darning needle until the epidermis is removed and the pink cutis vera is exposed. Bleeding should be avoided. The eye of the needle is then charged with undiluted old tuberculin, and pressed into the prepared vascular surface with a rotary motion. This procedure differs from that advised by Pirquet in the careful preliminary excoriation of the skin, and thus renders more certain the contact of tuberculin with the skin capillaries. This difference is enough to secure success when the tuberculin reaction is feeble.

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MALIGNANT GROWTHS.

Results of Radium Therapy of Carcinoma of the Uterine Cervix.—On the basis of sixty-three cases observed over a period of eight years, O. Beuttner (*Schweizerische medizinische Wochenschrift*, February 1, 1923) believes that the result of radium therapy depends not so much upon the microscopical appearance of the carcinoma or the number of millicurie hours applied, as on the age and general condition of the patient. The best results were observed in the older patients. Radioactive bodies are also given intravenously. The author's statistics show the great advantage of radium therapy, especially in the inoperable cases. In the nine operable cases, only four patients were cured by irradiation and in the right borderline cases, four patients were also cured. The author's experiments show that even if it is still a moot question whether operable carcinoma should be removed surgically or by irradiation, the latter gives better results in inoperable cases than the older palliative methods.

Rapidity of Growth of Carcinoma of the Uterus.—Walter Forst (*Zentralblatt für Gynäkologie*, May 13, 1922) states that the early subjective symptoms of uterine carcinoma are obstinate discharge, especially when it resembles the color of meat water, and hemorrhages after the onset of the menopause, as well as after douching and after coitus. The last is reported very often in cervical carcinoma. These symptoms are frequently present when macroscopically there is no irrefutable evidence of carcinoma and the diagnosis can then be made only after a microscopic examination of tissue. On the other hand, there are cases in which the cervix and even the vagina show, macroscopically, unmistakable carcinomatous tissue, without the patient mentioning any of these symptoms. Bleeding depends upon the structure of the carcinomatous tissue and no symptom is capable of indicating the age of a carcinomatous process. The other two symptoms, when caused by carcinoma, indicate degeneration of the carcinomatous tissue. Besides, the intelligence and cleanliness of the patient play an important part. A certain judgment of the rapidity of the cancerous growth can be made only when the whole process can be watched by the observer.

Such a case is reported in a woman, forty-nine years old, who complained of having bled for five months with freedom from bleeding at short intervals, after a menopause of two months' duration. A curettage stopped it temporarily. The general physical examination was negative. The vaginal portion of the cervix was somewhat hypertrophied and hard, and there was an extensive deep red erosion around the os, which bled at the slightest touch. The uterus was not enlarged and the adnexæ were free. An exploratory curettage and a biopsy on the vaginal portion of the cervix showed no histological evidence of carcinoma. The woman was examined vaginally regularly every two weeks and six days after a previously negative finding the hemorrhage reappeared together with a foul smelling discharge. About three weeks later, the patient appeared wretched and tired, and a vaginal examination revealed a cloudy, watery, stinking discharge, and the vaginal portion of the cervix was found transformed into a nodular tumor almost as large as a fist, from which large pieces of tissue could be easily broken off; on the left side, the tumor invaded the vagina and the left parametrium was rigid. The microscopical examination revealed a decomposing, pavement cell carcinoma. This condition was seen to develop within thirty-one days, indicating a very malignant course, which ended fatally.

Cancer in Cervical Stump.—Robert T. Frank (*Surgery, Gynecology and Obstetrics*, September, 1922), reports a case of stump cancer, noticed within five months after supravaginal hysterectomy for fibroids of the uterus. It is, therefore, fair to presume that the carcinoma was overlooked at the time of the operation. Complete hysterectomy for fibroids of the uterus is not recommended as a routine measure, because of its increased mortality over supravaginal amputation. Increased care in examining the cervix, before all operations for uterine conditions are undertaken, is enjoined and it is suggested that the patients after operation be warned to note and report bleeding or abnormal discharge. A metastasis in the nonadherent appendix is reported as a unique site of secondary deposit from cervical cancer.

Syncytioma of Uterus.—Henry E. Meleney (*Surgery, Gynecology and Obstetrics*, August, 1922) reports a case of atypical chorioma, in which the necropsy showed a small tumor in the right cornu of the uterine cavity, acute infection of the endometrium extending through vessels about the right fallopian tube, acute diffuse peritonitis, and hemolytic streptococcus bacteriemia. The tumor consisted only of syncytial cells lying singly and in clumps in the swollen stroma of the uterine mucosa and in the superficial portion of the myometrium. The case illustrates the importance of early determination of the cause of uterine bleeding, not only in order to deal properly with the tumor itself, but also to avoid a termination by acute general infection.

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The Physician and His Relation to the Compensation Law*

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The compensation law covers a field that is so broad and ramifies in so many directions, that I feel it only fitting to treat the particular phase in which we are interested—the medical aspect.

Compensation legislation was in force in Europe for a great many years before the United States became interested in it. The first interest shown in this country was by its adoption for government employees, such as postal clerks, and it was not until 1910 that any state enacted such legislation. This was the state of New York, and was our first Workmen's Compensation Law. The Court of Appeals declared it unconstitutional in the Ives case and made necessary a constitutional amendment to the laws of the state. The delay occasioned by this, brought us into the year 1914 before we had our second law, which is the one under which we are now operating. In the meantime, several states adopted a compensation law, and since, most of the balance, so that at the present time over forty states have such a law.

It seems to me well to impress upon you, before beginning any discussion of the medical phase of the law, that the principal parties involved in the act are the employer and employee, that all other factors, the physician, the insurance carrier, the adjustor and the commission are collateral. This necessarily limits us in our discussion to the conditions and facts which are beneficial or detrimental to the employee, employer or both. For that reason, the question of whether the individual physician is benefited personally or injured personally, by the enactment of the law, as far as finances are concerned, has no bearing except as it may affect the employee or employer. This statement could be made with greater force as regards the legal profession, as, I understand, the law deprived them of nearly fifty per cent. of their volume of income. This is an economic law and is for the betterment of the employee and society. On that basis this paper is written. As illustrative of what I mean, I might refer to the increased activities of the state in medicine, especially relative to the contagious and communicable diseases. Its scope has steadily enlarged and probably will continue to do so. As long as commensurate good to the public continues, no amount of argument against the plan, because of its influence on the income of the physician, will bear any weight. So whatever opinions I express or conclusions I draw, they are with that understanding. And further, I do not believe any man can discuss this phase of the law intelligently until he casts aside any bias he may have because of the law. It was not enacted for the benefit or the deprivation of the physician and whatever way the individual physician is affected by it, is purely incidental.

Under the medical section of the compensation law, we shall discuss two questions: first, limited or unlimited medical care, and second, the free choice of physicians.

Before doing this, however, I want to bring to your attention some of the various forms of laws which are now in force in the many states. They are as follows: Limited and unlimited medical treatment, limited and unlimited amounts for services, medical services furnished by the employer, medical services chosen by the employee and paid for by the employer and medical services furnished by and paid for by the employee.

Should the injured employee have limited or unlimited medical aid? Comparing the various state laws, we find that the range of service as regards time is from none in three states up through the two weeks, four weeks, thirty days, eight weeks, sixty days, ninety days and the unlimited period, in the last group there being sixteen states. Limitations as to amount for services range from nothing up to a definite amount of six hundred dollars and into the unlimited. The latest reports that I had access to showed four states which placed no limit as to time or amount. It is interesting here to note that legislation in this respect has been rapidly progressive toward removal of limit.

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*Delivered before the Broome County Medical Society, February, 1922.

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From the viewpoint of this law, as an economic one, looking to the benefit of the injured employee and society, as well as the employer, it seems that we are dealing with two forcible arguments, both in favor of removal of limitations. First, it is humanitarian and is demanded by public opinion. Second, the restoration of the injured employee to gainful occupation is essential to society, to industry and the employee. The injured workman receives the greatest good when returned to a gainful pursuit in the nearest to normal condition possible, and compensation paid him, regardless of the amount, is indeed a poor substitute for such restoration. Society and public opinion demand that the number of such derelicts be held to the lowest possible minimum, and finally it is to the interest of the employer, because it reduces labor turnover, maintains a more coordinate working force and in that way increases efficiency, and makes much more valuable the money expended by him for that purpose, than were it spent merely for compensation to the injured man.

We now come to the second question in our paper, which is the free choice of physicians. This will be treated, first, by expressing the arguments advanced in favor of the free choice of physicians, after which will be taken those arguments advanced in favor of the medical services being furnished by the employer.

It will be well for us, as before, to make some comparisons of the various laws existing in different states. In five states the employee is granted the right of selecting his own physician, at his own expense. These are California, Connecticut, Illinois, Missouri and South Dakota. Four states provide, that the employee may choose the physician at the expense of the employer, Massachusetts, Nebraska, Rhode Island and Washington. In Massachusetts the limit is two weeks; unless longer in the discretion of the Commission, Nebraska limits the right to cases of dismemberment and major operations. Rhode Island limits the time to four weeks, and Washington makes a provision that the employee must pay half of the medical cost. Four other states have an interpretation of the law allowing free choice. Twenty states allow free choice, if the employer neglects or refuses to furnish competent medical services, and the rest of the states simply provide for the furnishing of medical services by the employer, excepting the three states mentioned above, which provide no medical aid.

Selection by the employee and paid for by the employer—known as free choice. The reasons advanced for this method are: First, that it has generally been considered an inalienable right of mankind, second, the dissatisfaction with the kind of medical service furnished by the employer, and third, the feeling of the medical profession that the employee should make the choice.

The first reason advanced, that it is an inalienable right of mankind, is of force as regards the relation of doctor and patient in the usual life and activities of communities. That relationship is considered as private and personal, and encourages the development of confidence and faith in the physician. For this reason alone, the free choice of physicians should obtain unless strong and forcible arguments are arraigned against it. Second, the dissatisfaction with the kind of medical services furnished by the employer. As regards this, it does not seem to be a major proposition of the question involved. If unsatisfactory, it does not necessarily imply that it could not be made satisfactory and efforts toward that accomplishment should be instituted. The third reason, that the physicians feel that the employee should have the right of choice is relevant only as it concerns the relief of the injured workman and restoring him to his proper sphere in industry.

As medical men, we should approve the best aid that can be rendered the injured employee which includes early attention to accidents, proper hospitalization for serious cases, and the attention of qualified medical men for different types of injuries. Quoting from a paper, Selection of the Physician under the Compensation Laws, by Dr. John W. Mowell, Medical Advisor, State of Washington. "We often find that a workman who has received a serious fracture will select a man who knows little about fractures; also a man who received an injury to his eyes may go to an ordinary practitioner for treatment until the serious nature of the case makes it necessary to transfer him to an eye specialist, whom he should have consulted in the first place. This occurs more or less with all kinds of injuries." Further "To my mind the principle thing that can be said in favor of free choice of physician by the injured workman is the effect that it has on his mind, that is, the feeling that he is getting what he wants." This is from the medical advisor in a state where free choice exists.

Coming to the selection of the physician by the employer, as opposed to free choice, the following reasons are given: First, the burden of paying for the services rests upon the employer, and it seems reasonable that he should have the choice of selection. Second, he is naturally interested in reducing his compensation costs and, to an extent, this is dependent on the speedy restoration of the injured employee's earning capacity which in turn is dependent largely upon the adequacy of the medical or surgical treatment rendered. Third, that the employer is in a better position and more competent to judge of the efficiency of the physician. Fourth, the inability for the employer to know the following —competency of the physician attending the injured employee, whether unnecessary calls are being made, bills are being padded, prompt receipt of reports and overcharging generally.

The first reason, that the employer pays the bills and should, therefore, have the power of selecting the physician, is nearly an axiom and comes face to face with the reason propounded for the employee selecting the physician—that it is almost an inalienable right of mankind. Both can not be accorded to the respective interested parties and that one must obtain in which more fully meets the fulfillment of the law—the betterment of the injured employee and society. I quote from a paper by Dr. Frederick L. Van Sickle, Does the Two Years' Experience with the Workmen's Compensation Law of Pennsylvania Demand Amendment and, if so, How. "It can not, of course, ever be said that the law is satisfactory, or any law satisfactory which takes away the personal privilege of the employee, the right to select his own physician; and yet from a business standpoint, we can not and must not expect the employer, who is to pay the expense of treating the injured employee, to allow a haphazard method of business to obtain, wherein he has no control of his own expenditure and less control of the entire system upon which he must build his business in order that it may be a success: consequently, none of us must expect that the much advocated plan of the employee selecting his own surgeon can ever be realized."

The second reason is that the employer is interested in procuring efficiency in medical care in order to obtain the speedy return of the injured employee. Illustrative of this is the development in larger plants of the medical service where first aid rooms up to emergency hospitals are maintained together with a complement of doctors and nurses. It is of interest to note that in over fifty per cent. of all injuries there is a disability of one day or less and that less than twenty-five per cent, of injuries extend beyond two weeks. The importance of early medical or surgical attention to injuries is known to you and it likewise has become common knowledge to the employers and insurance carriers. In fact, I venture the opinion that they are more keenly awake to the necessity of it than is our profession generally, because of their intimate knowledge of the results of neglect to obtain early treatment. I now quote from an article by Dr. H. H. Hartung entitled, Medicolegal Phases with Particular Reference to Tort Cases, Compensation and Malpractice Suits. "Prevention is more desirable than the payment of compensation and workers are more desirable than non-workers as they are more valuable to themselves, their employers, and the community. . . . After a certain length of time following the passage of this law (free choice) it was found the best results were not being obtained, and on recommendation of the board the law was changed, requiring the nsurance companies to furnish full medical treatment giving them the privilege of advising them who should treat the cases. There is a very good reason why the insurance companies are interested in this matter . . ." From the employer's viewpoint it s also to be remembered that he was to make an early report of all cases, that he wants dressings made in minor cases early and promptly, with the result that the man's absence from work is as short as possible; this being also to the advantage of the njured, and last, that he can place the responsibility for these things being done on one or a few doctors but would lose all control if the only limit was the number of physicians in the community.

We next come to the third reason, which is, that the employer is better able to select a competent physician than the employee. In considering this phase of the question, I want to bring to your attention several facts. This is a compulsory state law, and, of necessity, equally applicable to all parts of the state. That the smaller locality, the less the choice that exists, and the larger the community, the greater the choice. That the least qualified and the best qualified are found in the largest commuities. In New York State there are 15,213 physiians and of that number 8,729 are in New York City. Also of that number, 15,213, we find in our parent body, the State Society, 9,381, leaving outside of the fold about 6,000. With these facts in mind, is it a question, or does it become a certainty, that the employer is in a better position to choose than the employee, and do so with benefit to the injured workman. Let me again quote from the article by Dr. John W. Mowell, medical advisor to the Commission in the State of Washington. "Under what is known in our state as the State Plan, the law grants the workman the privilege of selecting his own physician in case of injury, provided he resides within a reasonable distance from the injured workman. While this plan seems quite equitable and it appears to be the natural thing to do, it has a good many shortcomings. For instance, to the isolated workman, who is employed in a locality where there are only one or two physicians, free choice means little, and the injured workman has to accept the services of the first physician he can obtain. However, in the larger cities where there is a great number of physicians we find that some of the workmen make a wise choice, while quite a large percentage of them, for some reason or other, select a physician who is not very well equipped for the work at hand." Quoting from an article in the *Boston Medical and Surgical Journal,* June 12, 1919, on Medical Aspects of the Workman's Compensation Laws, by Dr. James Warren Sever, of Boston: "Osteopaths, chiropractors, neuropaths and various other 'paths' are engaged in this type of work, even in Massachusetts * * *. The time is coming, when the state or the insurance company, or both, will select the medical men best qualified to treat these industrial accidents, and when that time comes, the patient will lose through legislative amendment the right to choose his own physician. The right to choose one's own physician is really the decision on the part of the injured workman to treat his own case as he sees fit . . ." This is from a man in a state where free choice exists.

We now come to our fourth reason which really includes several features, all of them aimed at the medical fraternity if free choice was available. The portion of this reason which I shall discuss is the question of competency of the physician. That has been pretty thoroughly covered in the preceding reason and really overlaps it. Referring to the 1916-17 annual report of the California Commission, I quote: "Many poorly equipped medical men are not above accepting industrial cases which they can not handle. The commission feels keenly its responsibility in this matter and, of course, desires that the very best services shall be accorded the injured workingman. * * * The situation constitutes a distinct menace at the present time, and suggests possible failure of the good effects of a most excellent law." The other portion of this reason—unnecessary calls and the padding of bills are outside of the domain of this paper—just as was the reason for the free choice—that the physician feels that the employee should have free choice.

Based on the facts outlined above, I feel justified in the following opinions: That unlimited medical treatment for the injured workman should be provided. That the free choice of physicians is not to the best interests of the employer, the employee and society. This is especially evident when one takes into consideration the opinions of medical departments of commissions and others in those states where free choice exists. That the compensation law is sailing an uncharted sea, as far as precedents are concerned, because it bears no relation to the old employers' liability act under which previously all such cases were tried. That, as an economic law, it is a signal success and denotes a tremendous leap in the direction of progress when compared with the law preceding it. That our efforts should be towards a constructive betterment of the workings of the law as regards the medical section, and this I wish to speak of in more detail.

Having in mind the great percentage of injuries that are slight and have only a short disability, provided prompt attention is afforded, it seems necessary to provide a means of bringing the physician and the injured employee into contact easily. The best solution I know of is the industrial physician and the plant medical department where it is possible for the injured workman to report and be able to obtain immediate treatment. This is analogous to the first aid station or infirmary of the army and as such should rank in the same relative importance. For the small percentage, who have more serious injuries and need more technical care, it is my opinion that they are outside of the realm of the first aid or dressing station and should be sent to the hospital and to men known to be qualified for that type of work. If the physicians engaged by the employer or the insurance carrier treat conditions for which their training and experience has not fitted them, the blame should be placed upon the employer or the insurance carrier who has assumed the responsibility of providing adequate care to the injured employee. I am firm in my conviction that surgery is a specialty and that for such work a man needs training, experience, and time for reading, which is not possible if his time is given up to routine medical practice. The law requires the employer to furnish medical treatment and implies adequate treatment. As I have shown, the law is so framed as to provide a means for the employer to provide medical treatment and that being the case no employee or insurance carrier can evade the responsibility which accompanies it.

In the final analysis the objective of the compensation law is to restore the injured workman as completely as possible. That means that the end result is obtained only when everything possible has been done for the injured employee.

The Variations of the Uric Acid Content of the Blood in Gout

By CHARLES FINCK, M.D.,
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Since the discovery of sodium urate in the articular concretions of gouty patients by Tennant, 1795, and by Wollaston, 1797, and since Garrod, 1846, demonstrated by means of his thread experiment that the blood in gout contained an excess of uric acid, a paramount importance has been attributed to this substance. Today many authorities dispute its pathogenic significance in gout, though no proof can be advanced that the exclusive cause of the condition rests in the formation, destruction, or excretion of uric acid, nothing, on the other hand, justifies a denial that the substance participates in the evolution of this affection. Whether it is the chief actor or merely a side figure, its quantitative variations in the blood and in the urine of the gouty are of such significance as to deserve the attention which has been attached to them for the last two centuries.

The researches, the results of which are now recorded, were commenced in 1914, when the war interrupted them. My first publications on this question date from 1918; these (1) dealt with the variations of the uric acid content in the blood and urine during a course of the calcium cure. Since then my statements have been verified by Grigaut, Bricourt, and Schneider (2 and 3).

CONDITIONS OF OBSERVATION.

For the study of the variations in the level of the uric acid of the blood (uricemia) and of the urine (uricaciduria) in gouty subjects, I instituted the following precautionary measures: all my patients were submitted to a diet well defined as to quantity and quality. The régime adopted was a mixed diet, the food allowance being determined according to the weight of the patient in such a manner that the number of calories furnished every hour was equal to the bodyweight in kilograms. Twenty per cent. of these calories were supplied in the form of albumins, twenty per cent. as fats, and sixty per cent. as carbohydrates. Meat furnished half of the albumen ration in the form of meat, fowl, and fish, and it was given only during the midday meal. The other half of the protein allowance was supplied in eggs (one a day), in milk and its derivatives, and in vegetables.

The investigations were carried out with serum and not with whole blood. This fact is of capital importance, for the results obtained by the different investigators vary only because some worked with complete blood, while others employed serum. A serum, however slightly tainted, yields results which differ materially from those obtained with a clear serum. The blood was collected by puncturing a vein in the morning before breakfast; the quantity obtained must be sufficient to permit the work to be carried out under the best conditions.

At the outset, I employed the method of Roethlisberger (reduction of silver nitrate to invisibility by a drop of serum on absorbent paper), however, this had to be abandoned, since the results obtained were too inconstant. Next I adopted a combination of the methods of Ruhemann and of Pizzorno (N/100 solution of the iodide and sulphide of carbon), which yielded higher figures than my experience led me to expect. Finally, I utilized the method of Folin, Denis, S. Benedict, and J. Bogert, which is based on the property of uric acid to give a blue coloration with phosphotungstic acid in the presence of sodium carbonate. The method of Grigaut, though based on the same principle, gives somewhat higher figures than the preceding one. On the whole, the latter procedure is the one that seems to me to combine the greatest advantages, such as speed, exactness, and simplicity.

The blood serum of normal persons contains from one to three centigrams of uric acid in the fasting condition, particularly if the food taken on the preceding evening was free from purins. A mixed meal brings about a uricemia amounting to from two to five centigrams during the hours immediately following the intake of the food; however, the previous level is regained in about six or seven hours. Naturally, variations occur according to the nature of the diet and the amount of its purin content.

In gouty persons the position is altogether different. To begin with, the uricemia in the fasting condition is at a considerably higher level, so that readings up to five, six, eight, and even twelve centigrams may be obtained. A further increase occurs after meals, and this is more noticeable than in normal people; above all, it persists much longer. However, in spite of these peculiarities, it regains its initial level after only a short interval. In the course of the evolution of gout the level of uricemia undergoes variations: generally speaking, it corresponds to the duration of the affection. The uricemia noted in young subjects of gout is lower than in the old. It is true, though, that frequently another factor comes into play, namely, renal impermeability resulting from the kidney lesions which determine the onset of gout. However, it must be emphasized that impermeability of the kidneys is not the basis of the uricemia of the gouty. Chauffard, Brodin, and Grigaut have found hyperuricemia in patients with normal renal permeability; this fact a priori eliminates the theory which looks upon the impermeability of the kidneys as the actual cause of gout.

The uricemia of the gouty varies with the incidents which mark the evolution of the disease. The uric acid content of the serum in gout during the periods of acute exacerbations has been the subject of much discussion; while some investigators have found it increased, others report a diminution. These divergences of opinion are due to the fact that the examinations were carried out at different periods in the evolution of the attack. Our researches have demonstrated that the level of the uricemia does not commence to vary until the second or, even, third day after the onset of the exacerbation; by that time, it may amount to a quarter or a third as much as the uricemia measured before the beginning of the attack. Authors who have limited their investigations to specimens of serum collected at the commencement, have naturally had to conclude that the level of the uricemia remained stable; on the other hand, those who carried out their estimations during the period in which the attack developed, recorded increased values. Observations XII and XVI demonstrate the progressive increase during the course of the exacerbation; it amounts to nine, twelve, thirteen centigrams, respectively, on the first, second, and third day in observation XII, and to eight, ten, ten in observation XVI.

As a general rule, the statement may be made that the uricemia is more considerable during acute attacks than during intervening quiescent periods. In observation V it changes from eight to eleven, in observation IX from seven to eleven, in observation XII from nine to thirteen, in observation XVI from eight to ten. After the disappearance of the acute manifestations of gout, provided this has not been brought about by certain therapeutic agents, the uricemia persists for a certain time; later, it drops to a level more or less like the one observed before the attack.

It is clear, therefore, that, contrary to the opinion generally accepted, the acute stage of gout is accompanied by a notable increase in the uricemia, and, furthermore, this increase persists after the disappearance of the acute phenomena of the attack.

The variations of the uricemia have often been attributed to alterations of the chemical reactions of the blood. Here again it has been my aim to control the facts. I have, therefore, investigated the modifications of chemical reactions for uric acid and the serum. Just as in normal subjects, the serum of the gouty is alkaline. The variations of this alkalinity are rapid and extensive; however, the difference between healthy and gouty subjects lies in the fact that the values observed oscillate between different limits in the two groups.

`Expressed in cubic centimetres of a decinormal solution of soda, with phenolphthalein serving as indicator, I have been able to determine the following values for one c. c. of serum: its alkalinity corresponded in the healthy to values which generally oscillated between 1.70 c. c. and 2.40 c. c., and in the gouty between 0.9 c. c. and 1.80 c. c. (Technic: The albumin is removed from the serum by trichloracetic acid. To two c. c. of this serum a few drops of a solution of phenolphthalein are added. Into this mixture decinormal soda solution is then dropped, until a persistent rose coloration has been obtained. The number of N. of c. c. employed is noted. In similar manner one c. c. of the solution of trichloracetic acid is treated, and the number of N′ of c. c. of decinormal soda solution utilized is noted. It is obvious that the alkalinity of one c. c. of serum is represented in c. c. of the decinormal solution of soda by the difference N-N′.)

It follows, therefore, that gouty serum is hypoalkaline during the intervals between attacks as compared with the serum of healthy subjects. This fact is of considerable interest and deserves to be remembered, for hypoalkalinity of the serum is not encountered in the uricemia observed, for instance, in cases of nephritis. Observation VI is a remarkable proof of this difference: a uricemia of 0.14 corresponds to an alkalinity of 2.3, that is, a normal alkalinity. The majority of authors hold the view that the alkalinity of the blood diminishes during the evolution of an attack of gout. Pfeiffer, Jeffries, Drouin, and Luff, on the other hand, have shown that this alkalinity increases. My own observations are in conformity with those of Luff; in all instances I was able to demonstrate an increase in the alkalinity at the commencement of the acute attack. It may suffice to refer to observations V, VIII, IX, XII, XVI. At the same time I have observed that serum taken from gouty patients during the acute stage can still dissolve uric acid; this is a fact which invalidates the view that the blood becomes saturated with uric acid at the moment the attack commences. After the exacerbation subsides, the level of the alkalinity of the serum remains above the values observed before the attack and this condition persists for varying lengths of time.

Observations V and IX plainly demonstrate that the level of the alkalinity of the serum varies with the uricemia. In observation V a uricemia of 0.08 goes together with a serum alkalinity corresponding to 1.2 c. c. of a decinormal solution of soda for every c. c. of serum, whereas a uricemia of 0.11 corresponds to 1.7 c. c. of a decinormal solution of soda expressed in the same terms. To a uricemia of 0.97 corresponds an alkalinity of 1.4 in observation X; and to a uricemia of 0.11 corresponds an alkalinity of 2.1. For this reason our second conclusion states that the acute stage of gout is accompanied by an elevation of the alkalinity of the serum.

By preparing the variations of the uricemia with the alkalinity of the serum, it is found that the level for the two values varies in the same direction, i. e., the uricemia increases and decreases with the alkalinity of the serum; however, there exists no proportional relationship between the oscillations of these two characteristics.

Starting with these findings, it was thought of interest to determine whether the intake of alkalies or of acids modified the level of the uricemia. The repeated consumption of alkalies does, in fact, increase the uricemia, as I have demonstrated in 1918 by describing the mode of action of calcium sulphate waters, and these findings have since been confirmed by Schneider. The alkalies must therefore be considered to favor the onset of acute attacks of gout. The supervention of acute exacerbations in the course of the alkaline treatment is by no means a rare occurrence, and physicians practising at alkaline stations have frequent opportunities to verify the truth of this remark. The proof of these facts may be found in observations VIII, IX, XVIII. I have witnessed the uricemia of a patient subjected to the alkali cure increase from 0.07 on the fourth day to 0.15 on the twelfth day.

The frequent administration of phosphoric acid (Joulie's treatment) exercises an influence on the uricemia which is diametrically opposed to that caused by the alkali treatment. We have noted that patients who have been submitted to this treatment for some time, have declared that since the commencement the attacks have become less frequent; on the other hand, however, several of them noticed an increase in the size of their tophi. The examination of the blood serum in these cases has shown that the average level of the uricemia was neither above nor below that of other gouty subjects, only the alkalinity appeared to be more or less diminished. The figures obtained are among the lowest I observed (observations X and XI).

There still remained the task of studying the variations of uricemia under the influence of an heroic gout remedy—colchicum. On the same occasion I recorded the results obtained in two cases of acute exacerbations of gout treated by subcutaneous injection of the fluid taken from blisters.

Among all the numerous drugs used in the treatment of gout, colchicum stands highest in the favor of the patients. If it is taken at the beginning of the attack, it stops its development, arrests the painful, inflammatory swelling, and brings immediate relief. Colchicum also instantly stops the increase of hyperuricemia, usually noticed at the onset of the exacerbation, but, on the other hand, it only slightly modifies the alkalinity of the serum. The patient in observation VIII had a uricemia of 0.12, during the period of the attack, with an alkalinity of the serum corresponding to 1.8 c. c. of decinormal solution of soda after treatment with colchicum extending for three days. The attack left only a slight amount of discomfort; while the level of the uricemia fell to 0.07, the serum alkalinity remained at 1.9.

I have treated a certain number of cases by means of subcutaneous injections of the fluid from blisters, thus administering a kind of autoserotherapy. The following is a description of the method: As soon as the first symptoms of the acute attack appear, a blistering agent, calculated to yield about five c. c. of fluid, is applied to the patient. The swelling is then punctured, under all aseptic precautions, with the needle of a syringe, and the fluid, thus collected, is injected under the skin. By this method it is often possible to arrest the development of an acute attack. Moreover, if the level of the uricemia is examined at the same time, it is found that it has regained its original level after having commenced to rise at the onset of the attack.

Observations V and XIII give a record of two cases of this kind. In observation V the hyperuricemia, which had reached 0.11, has dropped to 0.09, and the alkalinity has similarly receded from 1.7 to 1.5. In observation XIII the hyperuricemia has fallen from 0.13 to 0.08, while, on the other hand, the alkalinity has only varied slightly, namely from 1.4 to 1.2.

Thus it has been shown that colchicum and the subcutaneous injection of fluid from blisters arrest the attack of gout and force down the level of the uricemia. However, while in other cases the variations of the uricemia are accompanied by changes in the chemical reaction of the serum, this does not occur to any morked extent in the instances under review. It appears that such changes do not take place with the same regularity as in the cases recorded above.

CONCLUSIONS.

The gouty person is in a condition of permanent hyperuricemia, the degree of which is still further increased at the onset of the acute attack.

The alkalinity of the blood is diminished in the gouty, but it increases at the beginning of the exacerbation. The excretion of uric acid increases during the attack: in some cases to a very marked extent, in others in a less pronounced manner.

In the latter case, on the other hand, a considerable increase in the excretion of urea takes place. The use of alkalies raises the uricemia, while acids diminish it. The former favor the production of acute exacerbations, the latter reduce their frequency.

Colchicum, administered at the beginning of the attack, arrests the characteristic feature, the increase of hyperuricemia, and, at the same time, it reduces the urinary excretion of uric acid.

These facts are in opposition to the conception held up to the present, that exacerbations of gout are the vivid manifestations of the precipitation of uric acid in the tissues.

In fact, if the attack were of this nature, the uricemia would not increase with its development, on the contrary, instead of increasing, the uric acid content of the body fluids would actually diminish, were they to rid themselves of their abnormal burden by discharging it into out of the way tracts of the organism.

If the attack corresponded to the saturation of the body fluids with uric acid and the albuminoid substances, which are found together with it in the blood of gouty subjects, the serum of gouty patients would be incapable, during the attack, to dissolve further amounts of uric acid. This, however, is not the case.

If colchicum stops an attack of gout by stopping the increase of hyperuricemia, one of its characteristics, this proves that the exacerbation is accompanied, not by a precipitation, but by a resorption of uric acid.

Perhaps it may be suggested that the formation of tophi after an attack of gout is in opposition to my conclusions. In reply to this, I would point out that the formation of tophi often occurs in the absence of acute exacerbations, that they almost always improve with the onset of the attack, and, finally, that they frequently disappear after a pronounced and violent attack.

The progressive increase in the size of articular tophi after successive attacks is due to the local inflammatory reactions which determine the rapid resorption of gouty deposits. In any case, it must be kept in mind that joint tophi contain considerably larger amounts of calcium carbonate and phosphate than uric acid. It is the lesions due to osteitis which bring about the formation of tophi, and, if they increase after every attack, it is not due to the arrival of fresh supplies of the socalled gouty substance, but to a new outbreak of osteitis.

Although it is clear that alkalies favor the cessation of an attack of gout, it is not possible to state that the production of an attack depends exclusively on the reaction of the tissue fluids.

Other causes of circulatory and nervous nature must be reckoned with. Thus the study of the oculocardiac reflex has revealed to me that all gouty subjects are, so to speak, sympathicotonics. Perhaps the etiological factors of gout will be found in the pathology of the sympathetic sytem. What I desire to demonstrate in the present paper, is the fact that the acute attack is a phenomenon of absorption and not of formation of gouty deposits.

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2. GRIGAUT, BRICOURT AND SCHNEIDER: Variations in the Blood Content of Cholesterin, Urea, and Uric Acid Under the Influence of the Mineral Water Cure of Contréxeville, *Presse médicale*, June 1, 1921.

3. SCHNEIDER: Contributions to the Study of Thermal Crises, *Gazette des Eaux*, June 30, 1921.

No.	*Summary of Observations*	*Uric Acid in Blood.*	*Alkalinity of Serum.*	*Uric Acid in Urine.*	*Acidity of the Urine.*	*Cholesterine of Blood.*	*Urea.*
I. Bd.	Chronic gout. Convalescing after attack. Formerly used colchicum. Chronic glaucoma which improves with the onset of the attack. Small tophi...........	0.09	1.30	0.86	2.	2.10	0.42
II. Ds.	Chronic gout. Last attack 6 months ago. Since two months alkali treatment. No tophi...	0.04	2.3	1.18	1	...	...
III. Dl.	Recent gout. Frequent attacks, easily stopped by colchicum. No tophi.	0.07	1.10	0.73	2.25	...	...
IV. Dx.	Chronic gout. No tophi. Has used colchicum. Actual uremic nephritis developing.	0.13	1.17	0.84	1.50	...	0.
V. Fe.	Chronic gout treated by colchicum. Numerous large tophi...........	0.08	1.2	0.78	2.	...	...
	After 12 days of Vittel cure, attack of gout.	0.11	1.7	1.27	1.5	...	...
	Injection of fluid from a blister; pain and redness disappeared in 3 days.	0.09	1.5	0.69	1.75	...	...
VI. Gt.	Vague joint pains termed gouty by reason of excess of blood uric acid. In fact, uremic nephritis. Has never had attacks of gout....	0.14	2.3	1.27	2.	...	...
VII. Ht.	Chronic gout. Aortic atheroma. Has had a few attacks in the big toe. No tophi. Alkali treatment.	0.03	1.5	1.06	1.75	2.4	...
VIII. Kir.	Chronic gout. Habitual treatment by colchicum. Tophi. Treatment by alkaline waters. Attack of acute gout.........	0.12	1.8	1.18	1.50	...	...
	Stopped by colchicum..	0.07	1.9	0.56	1.25	...	...
	Resumption of alkali treatment on 8th day...	0.11	2.1	1.38	1.50	...	...
IX. Mt.	Chronic gout. Frequent attacks. No tophi.....	0.07	1.4	0.73	1.75	...	...
	Acute attack on 10th day of calcium water treatment.	0.11	2.4	1.16	2.	...	...
X. Mrt.	Chronic gout. Treated for many years with phosphoric acid. Numerous tophi on hands and feet. Has had no more attacks since having this treatment. Suffers discomfort only occasionally through tophi.	0.10	1.3	0.88	2.75	...	...
XI. Mn.	Chronic gout. Tophi on hands and feet. Has been using colchicum for a long time; is now having phosphoric acid treatment.........	0.12	0.9	0.96	2.75	...	...
XII. Mr.	Acute attack of gout:						
	1st day............	0.09	1.3	0.64	2.50	...	...
	2nd day............	0.12	1.7	1.28	1.75	...	...
	4th day............	0.13	1.75	1.42	1.75	...	...
XIII. Nr.	Chronic gout. Attack in the knee in the course of treatment..........	0.13	1.4	0.78	2.75	...	0.65
	Injection of fluid from a blister..............	0.08	1.2	0.42	2.50	...	...
XIV. Nr.	Chronic gout. Uremic nephritis.	0.14	1.9	0.65	2.75	2.70	1.2
XV.	Chronic gout. Has had a series of successive attacks in the course of which the tophi softened and regressed.........	0.08	2.3	0.55	2.50	...	...
XVI. Te.	Acute gout in the wrist:						
	1st day..............	0.08	1.2	0.67	2.	...	...
	2nd day............	0.10	1.4	1.14	1.75	...	...
	3rd day............	0.10	1.7	1.27	1.50	...	...
XVII. Ve.	Chronic gout. Treatment at times with alkalies, then with colchicum, or dieting. Aortic atheroma.......	0.09	1.9	0.68	2.50	2.40	...
XVIII. Wg.	Chronic gout. Stiffness of joints of feet. No visible tophi.						
	Recent treatment of an attack by colchicum...	0.06	1.83	0.94	2.75	2.40	...
	Followed by prolonged treatment with alkalies.	0.11	1.80	1.27	1.50	1.80	...
XIX. Wn.	Gout and oxaluria. Lesser joint attacks, untreated.	0.15	0.9	1.84	3.	...	...

The Treatment of Precancerous and Cancerous Lesions in the Mouth*

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While cancer in the oral cavity is very accessible and readily recognized in its early stages, it is one of the most fatal forms of cancer, and its treatment, up to the present time, has not been well directed. The ultimate mortality has been maintained by temporizing with small but fully developed lesions, the extravagant sacrifice of tissue in mild cases, and frequently the patient is allowed to succumb with no treatment at all. Distant metastasis is infrequent, the disease seldom breaking through the lymphatic collar of the neck, thus giving a greater opportunity for treatment of these conditions.

If we want to improve our cancer statistics, we must recognize the great importance and significance of precancerous lesions, and direct our attention to their removal before they have a chance to become dangerous. The onset of cancer is insidious and accompanied by few and unimportant symptoms. It is generally recognized that the majority of cases start as apparently innocent benign lesions, and that the transition into the malignant stage occurs very insidiously. It is the chronic, continuous irritation and not the acute injury that is the starting point of cancer and any lesion, no matter how innocent it may appear, if subject to or producing irritation, may, in a susceptible person, quietly undergo a malignant change before the seriousness of the condition is realized. Therefore, we must consider primarily what these precancerous lesions in the mouth are and what form of treatment is best adapted to their eradication.

Leukoplakia is one of the most common forms of precancerous lesions in the mouth and is itself frequently the result of some irritation. It may develop slowly or acutely. I have seen a patch of leukoplakia develop rapidly as the result of a sharp tooth rubbing the tongue. At other times, it is the development of months or years. The relation of syphilis to this condition has been much debated, but careful investigation has shown that the greater percentage are not associated with syphilis and only twenty-five to fifty per cent. of cases have shown a positive Wassermann, as reported by different authorities. A large percentage of cases give a definite history of excessive use of tobacco and, as a rule, in these cases the lesion is widespread and includes considerable mucous membrane. Chewing tobacco would appear to be a more likely cause than smoking, especially when the quid is always held in the same location in the mouth. Rough or diseased teeth by their mechanical irritation initiate the disease in the great majority of cases, especially where they come in contact with the cheek or tongue.

The earliest change in the mucous membrane is an inflammatory process with secondary hyperkeratosis. As the disease progresses, there is increased hyperkeratosis so that the papillæ become obliterated and an inflammatory infiltration of the cornium with small round cells takes place. A small white patch is the first evidence which, as the disease progresses becomes pearly or milky white and shows thickening and infiltration. At times, the patches become quite thick and indurated suggesting a malignant change. Prompt and careful treatment should be the rule, and the first thing is a thorough cleansing of the mouth. All sharp and decayed teeth should be removed, and the use of tobacco interdicted. This may suffice to clean up some cases. For the established lesions several forms of treatment have been suggested. Antisyphilitic treatment has no effect on the established lesion. Röntgen ray treatment is difficult and as a rule useless. Radium has been successfully employed and in certain cases is to be preferred, but the technic must be correct and exact.

Destructive treatment has been the most successful. The actual cautery has been used for this purpose but is not recommended because you can not accurately control its action, and the resulting scar is frequently as dangerous a source of irritation as the original leukoplakia. The use of the high frequency current for its destructive effect is ideal because we can accurately control its effects, the technic is easy and the healing takes place with a soft pliable scar which is almost a regeneration of the healthy mucous membrane.

The currents used for this destructive effect are high frequency currents but vary in voltage and amperage, and each has its own particular use and indication depending on the nature and the extent of the tissue to be destroyed.

The current is obtained from the high potential coils where the commercial current, either direct or alternating is transformed by means of a coil and leyden jars into a current of high potential and frequency. The Oudin current is the one most frequently used for destruction of areas of leukoplakia and all smaller growths, and is of relatively high voltage and low amperage. Only one wire is necessary for the employment of this current. It is capable of accurate regulation, and we may obtain a current so fine that it may be used on the cornea of the eye. This current simply dehydrates the tissue thus destroying it, and has therefore been called the desiccating current.

Where more powerful effects are desired, we employ the D'Arsonval current which is of low voltage and very high amperage and thus produces a great amount of heat. This current must be employed with two wire or bipolar and is used for destruction of large growths. We use a large pad on some indifferent part of the body as the inactive pole, and a needle point as the active pole. The effect of this current is more of a coagulation, but without carbonization, and has been designated electrocoagulation, or high frequency cauterization. While there is no selective action on malignant tissue, the current is driven in with such high voltage that it produces heat well beyond the area actually destroyed. Cancer

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*Read before the Lycoming County Medical Society, Cancer Day, November 10, 1922.

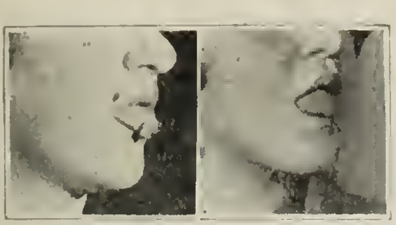

FIG. 1.—Fibroma of tongue. Three years ago a small pimple appeared on tongue, growing rapidly the last few months. Was pedunculated and hard, giving no pain. Easily removed by electrothermic method. Frequently a precancerous lesion.

Second illustration shows results of electrothermic removal.

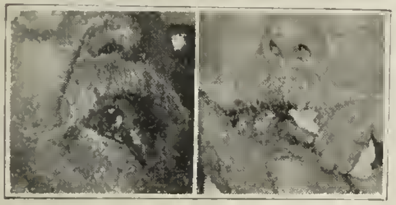

FIG. 2.—Six months ago patient noticed sore throat and a small wart on side of tongue. Last few weeks has grown rapidly. No pain. Ulcerated growth size of quarter, slight induration. No. glands palpable. Pathological report epithelioma. Destroyed by electrothermic method and radium applied to neck.

Second illustration shows result after treatment.

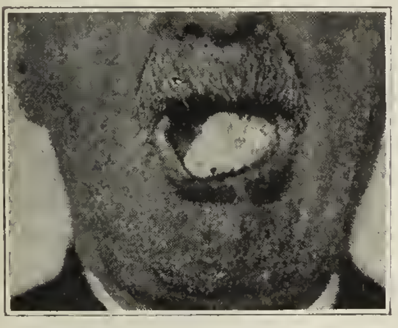

FIG. 3.—Extensive leukoplakia of the tongue. Began as a small white spot three years ago, and has grown rapidly in last six months. Now very thick and indurated. Character of lesion which eventually ulcerates and becomes malignant. Removal of the lesion by the electrothermic method in the early stages prevents cancer.

cells are known to succumb to a less degree of heat than normal, and thus we get devitalization of cancer cells well beyond the area actually destroyed. These currents are all subject to great regulation as to the heat produced which may vary from a simple hyperemia to actual carbonization. We are thus enabled to obtain a current suitable for each case depending on the size and location of the growth to be destroyed. As leukoplakia is as a rule a superficial lesion the Oudin current is employed and with careful technic, the diseased mucous membrane can be removed with very little effect on the healthy tissue, and the healing which follows is all that could be desired.

Ulcers are a frequent precursor of cancer and are of four varieties; simple, tuberculous, syphilitic and malignant.

Any ulcer in the mouth which does not show decided healing after two weeks' time, and after any exciting cause has been removed should be regarded with great suspicion. If there is any one thing more harmful than another in the treatment of an ulcer of the mouth it is the application of strong caustic. A simple ulcer may thus be made malignant, and a malignant one stimulated to more active growth. Simple ulcers are, as a rule, due to the mechanical irritation of a sharp tooth. They are shallow and have no indurated edges and on removal of the cause promptly heal.

Tuberculous ulcers are usually associated with tuberculosis of the lungs. The edges are sharp cut, undermined and everted, and the ulcer is usually quite painful—they heal slowly or not at all.

Syphilitic ulcers may be in the form of a chancre with its classical symptoms or a brokendown gumma. The latter is usually multiple, deep with excavated and uneven edges, some infiltration and considerable discharge. The glands, if involved, appear early in the disease. Differential diagnosis is very important as the resemblance to cancer is often close, and it would be unfortunate to sacrifice important structures needlessly.

When properly diagnosed antisyphilitic treatment promptly heals them, but it is well to remember that we frequently have syphilis and cancer associated in the same lesion. Any of these forms may become malignant, and if after appropriate treatment for two weeks there is not a decided improvement, they should be regarded with suspicion.

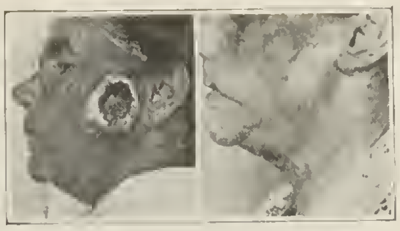

FIG. 4.—In April, 1919, small wart appeared on face. Month later, doctor tied a string around it. Began to grow again very rapidly until large ulcerated mass resulted. Entire cheek infiltrated, including the mucous membrane. No glandular involvement. In November, patient treated by radium needles buried one inch apart covering entire growth. Radium plaque applied to neck. Only one treatment was given.

Second illustration shows result after healing. Part of facial nerve was destroyed. Cheek is soft and free from disease almost four years.

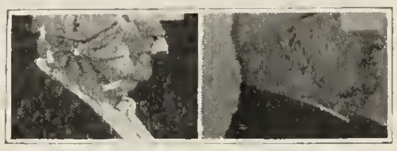

FIG. 5.—Malignant involvement of the glands of neck beginning two years after surgical removal of carcinoma of cheek. No recurrence at local site. Showing method of applying radium needles. Especial attention being paid the margins. Had this case received radiation at the time of operation, this condition would probably have been prevented.

Results after healing shown in second illustration. Complete disappearance of malignant tissue. Neck is soft and free from disease.

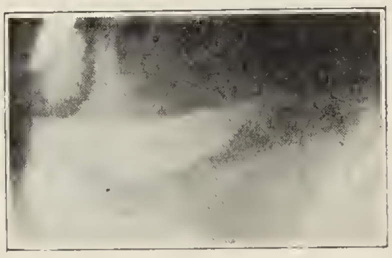

FIG. 6.—X-ray of mandible showing sequestrum formation after treatment of the jaw bone for malignant disease with the electrothermic method. Sequestrum usually separates in six to eight weeks after treatment.

An unfortunate procedure is the taking of a section and waiting a week or two for a report. Blood and lymph spaces are thus opened and the growth stimulated. In any event, if the ulcer is in question, regardless of its nature, simply syphilitic, tuberculous or malignant, its total eradication is indicated. This may be done surgically, but in the author's experience, the ideal method is the use of electrocoagulation which produces a complete destruction and seals the blood and lymph channels at once. Healing is prompt and the resulting scar is soft and pliable and does not form a further menace to the patient. This result is obtained in either simple or tuberculous ulcer, and in the syphilitic type when combined with specific treatments.

Rough or decayed teeth are a frequent and dangerous source of irritation. Sharp edges of a tooth will frequently cut into the tongue or cheek producing an ulceration, which, if not eradicated, will eventually undergo a malignant change. Decayed teeth, pyorrhea and tartar formation around the roots also cause a chronic irritation which frequently leads to malignancy. Badly fitting dental plates, or bridgework, are occasionally found as exciting causes of cancer. The proper treatment is thorough cleanliness and correction of dental defects. It is rare indeed to find cancer in a clean mouth.

Tobacco, unquestionably, acts as an irritant, and fully ninety per cent. of men with malignant disease of the mouth have a history of excessive use of tobacco. Nicotine is a decided irritant and when the heat of a pipe or cigar is added, this continuous irritation is just what is needed to produce a malignant change. Frequently, the first stage is a leukoplakia, as has been mentioned, and there can be no question but that tobacco is a very decided factor as an exciting cause of cancer.

While syphilis itself does not have a direct bearing on cancer, its indirect effects are important in preparing the tissue for a malignant change. Cancer may devolop in the scar of a healed syphilitic lesion even years later, while active lesions such as an ulcer, gumma, papilloma, or atrophic glossitis are commonly seen as exciting causes. Cancer and syphilis may both be present at the same time. If a correct diagnosis of syphilis is made, the lesion should heal promptly under antisyphilitic treatment. If it does not heal, the lesion should be removed as the chances are very great that we have a malignant lesion associated with the syphilitic one, and valuable time will be lost in temporizing with such a condition after a reasonable length of time has elapsed. Most of these lesions can be easily removed by the electrothermic method.

There are a number of more uncommon causes of irritation in the mouth, one of which may be mentioned, namely, angiomata. These may exist for years without causing trouble, but if for any reason, they are subjected to continued trauma, they may undergo a malignant change. Simple papilloma is seen not infrequently, and occasionally a salivary calculus may be the cause of trouble. Other causes are the use of snuff, or carrying tacks or nails in the mouth, as is the practice of certain workmen. All of these conditions should be eradicated as soon as possible.

It can well be seen that our first duty is the elimination of every possible source of irritation, and if the physician would consider this seriously, we would soon diminish the number of cases of cancer in the mouth. The easiest and best way to cure cancer is to prevent the development of the lesion, and not by extensive operation after it is fully developed.

Cancer of the mouth is always of the most malignant nature, infiltrating the tissue rapidly and involving the glands early. If the lesion has been present for six weeks or more, it is quite likely the glands are already involved, although this is not always the case. We must therefore realize the vast importance of early treatment, because if the glands are already enlarged, the chances of cure are very materially lessened. The local lesion very seldom causes the death of the patient but metastasis to the glands finally carries them off. It is bad practice to take a section for pathological study and wait a week or more for a report. Provision should be made for immediate examination of a frozen section at the operation, and then proceed at once in cases where it is pronounced malignant. The submaxillary and the submental glands are usually the first involved, followed by the superficial and deep cervical glands. An important fact to remember is that the anterior part of the tongue, and the floor of the mouth and lower lip, have a direct connection with the deep cervical glands, and the latter may be involved while the superficial glands are free. In an ulcerated lesion, the glands may be enlarged from a simple infection, but as a rule, it is not difficult to distinguish a malignant gland. It is very hard and usually adherent to adjacent tissue while the infected gland is doughy in feel and very tender.

Cancer of the tongue is one of the most distressing conditions the physician is called upon to treat, and a whole volume might be written on this subject alone. It may develop as an ulcerated destructive lesion, or as a simple induration in the muscle. It is frequently preceded by leukoplakia or other precancerous lesions which undergo a malignant change. The ulcerated lesion is superficial at first, and as it progresses, it becomes deeper, leaving the edges prominent and hard and showing an infiltration extending well beyond the margin. It is as a rule not very sensitive, and does not cause pain until well advanced. The first sign of pain and frequently the only symptom present is pain in the ear. At times, the patient is treated for earache or some dental irritation, and valuable time may be lost before the true nature of the condition is discovered. Later as the condition advances, there is considerable sloughing with frequent spells of bleeding, a malodorous, purulent discharge and severe pain. The infiltration increases and the tongue becomes fixed. The glands are enlarged, adherent and painful.

The most frequent spot for the lesion to appear is on the side of the tongue where it comes in contact with the teeth; another frequent site is the tip of the tongue and lastly the base. Cancer of the tongue is nearly always squamous cell carcinoma arising from the mucous membrane of the tongue, or the epithelial cells of the glands. Lymphatic vessels go to either side of the neck so that frequently the opposite side of the neck is involved. The deep cervical glands are frequently involved even where they are not palpable. If the growth has encroached on the floor of the mouth, the prognosis is very unfavorable.

TREATMENT.

Realizing the malignant nature of the condition, it is apparent that early treatment is essential. Various methods of treatment have been recommended. The surgical operation is usually a serious and shocking procedure and subject to the dangers of postoperative infection and pneumonia with from twelve to fifteen per cent. five year cures.

Radium is used, but to my mind it has an extremely limited field in this condition. Surface applications of radium are absolutely useless and may be dangerous, as they heal over a lesion leaving active disease beneath. The only course justified is the use of radium needles, and to this there are very serious objections.

It is difficult to estimate the right dose to secure action on the entire tumor mass, and the pain after treatment is very severe and lasts for weeks and sometimes months. The resulting scar is dense and hard, and it is impossible to say after the reaction whether the disease is still present, or whether the induration is simply due to scar tissue formation. At other times, we have a foul indolent slough which lasts for weeks. The suffering and discomfort is not justified if we have a method without these objections, and with superior results. If the operator desires to use embedded radium for its crossfire effect on the floor of the mouth, the lesion should be destroyed by the electrothermic method, about one week after the radium treatment and before the radium reaction has set in with full force and in that way most of the objections are removed. The x ray has absolutely no effect on this condition.

Experience has shown that the electrothermic method is by far the most satisfactory way of treating the local lesion. The control is such that we can destroy an ulcer with its surrounding induration without doing an extensive operation, or we may remove the entire tongue. In the latter case, a general anesthetic is given, and after the patient is thoroughly anesthetized, the ether is removed from the room as otherwise it would be set on fire by the spark. The mouth gag is then put in place and a suture run through the tongue. The tongue is drawn forward, and with a curved needle employing the D'Arsonval current, a line of coagulation is made across the base of the tongue. The tongue is then raised, and with a straight needle a line of coagulation is made under it and to the sides. With this current, the needle is plunged into the tissues to get deep penetration and greater destruction. Then with scissors, we cut through the coagulated tissue stopping when half way through for another application of the current to make sure coagulation has extended through the tongue. The tongue may then be entirely freed by cutting with scissors through the coagulated area, without the loss of a drop of blood. The base is then gone over with the current and again thoroughly coagulated. The coagulated area is allowed to separate as a slough which takes about a week. The patient suffers little shock, and the next day is up and out of bed. There is considerable swelling of the neck for two or three days, but very little pain. I have never seen infection follow and exceptionally a secondary hemorrhage, which usually occurs in patients with high blood pressure. There has been no operative mortality so far. Bleeding is most likely at the time of separation of the slough, but if proper care is taken, it is very unlikely to occur. Almost invariably the local condition heals up without evidence of disease except where the floor of the mouth is involved, when good results are not so easily obtained.

The advantages of the method is the complete destruction of all cancerous tissue at once, regardless of whether the lesion is small or involves the entire tongue, and absence of bleeding, shock, infection, or severe postoperative pain. At the end of two or three weeks' time, we can tell absolutely whether we have destroyed all disease or not, and if a diseased area remains, it can be treated at once. With proper experience, the local lesion can usually be eradicated at one sitting, and a healthy soft scar results after healing. If the glands are not already involved there is less likelihood of spreading the infection, as all blood and lymph spaces are sealed at once while surgery or radium needles cut into the lymph vessels. To one who has had experience with the electrothermic method its superiority is beyond question, and results which will be reported later will bear out this statement.

Success or failure in a case depends entirely on the glands as it is the glandular metastasis that kills the patient. The lymphatic glands act as a barrier to prevent the spread of the disease, and if they are not enlarged a block dissection should not be done. If extension takes place from the local lesion to the glands, it must travel by way of the lymph vessels either by direct lymphatic extension or by embolism, and if the glands are removed, these vessels drain into the tissue of the neck and thus infect the neck. Every case, regardless of whether the glands are enlarged or not, receives thorough radiation of both sides of the neck. The neck is marked out in small squares about twenty-four in number and to each one is applied fifty mg. of radium in a 0.5 mm. brass filter and separated from the skin by half an inch of gauze, for a period of four hours, making a total of 4800 milligram hours. This is repeated twice at six week intervals. If the glands are already enlarged more drastic treatment is necessary and we bury radium needles into the substance of the gland. These needles are about one inch in length and about the size of an aspirating needle. They are hollow and contain ten mg. radium. One end has a sharp cutting edge and the other end has the eye which is threaded with heavy silk. They are allowed to remain in the gland twenty-four hours after which they are withdrawn by means of the thread. From one to five or more needles are used depending on the size of the gland. and except for some very special reason this is not repeated. These cases receive in addition, the surface application of radium or heavy doses of x ray. If a single gland is enlarged it may be removed, and this is usually done about two weeks after radium treatment. In this way, we feel that all indications have been met to the best advantage and the patient given the greatest chance to overcome the disease.

Cancer of the alveolus usually begins around a decayed or rough tooth. At times, there is advanced pyorrhea or leukoplakia. Frequently, a tooth of this kind will be extracted and the gum does not heal, thus calling attention to the fact that something is wrong. At other times, the first thing a patient notices is a loosened tooth. There is seldom any pain. Examination shows an ulcerated urea, or a soft spongy bleeding gum with a malodorous discharge. The first thing to do in these cases is to make an x ray examination of the jaw bone to see to what extent it is involved. Only the margin may be involved or the disease may have extended half way through the bone. Examination of the glands will usually show the submaxillary gland enlarged, hard and adherent to the bone. Pain is usually absent until later.

Again, early treatment is most important. The surgical operation calls for complete resection of the jaw well beyond the diseased area with block dissection of the glands. This has been the only treatment in the past and was successful in a good percentage of cases, but left a marked deformity of that side of the face.

Fortunately, the electrothermic method will destroy the bone as well as the flesh, so that this form of treatment has a decided advantage over surgery in that we can destroy the diseased tissue with the current and then apply it to the bone, devitalizing and destroying only that part of the bone which is diseased. In this way, the healthy bone is allowed to remain and maintain the outline of the jaw. The devitalizing bone is allowed to remain and it sequestrates in about six weeks. I have seen cases in which not more than one eighth of an inch of bone has remained to support the jaw. This method is particularly valuable where the disease crosses the midline in front, because if this part of the bone is removed there is no support for the tissues ot the mouth and the patient is in a very deplorable condition. In these cases, the glands are most important, and careful attention must be paid to them, if we hope to get the patient well.

Epulis is of two varieties, the first being the hard fibrous tumor classified as fibrosarcoma. It is slow in growth and seldom produces symptoms, and if totally removed does not recur. The second variety is soft, vascular, grows rapidly and involves the bone. It is malignant and requires radical treatment. Both varieties are very satisfactorily treated by the electrothermic method. The growth is destroyed, the adjacent teeth removed and the bone treated well beyond the diseased area. Results have been very satisfactory.

Cancer of the floor of the mouth is usually secondary to cancer beginning in the tongue or alveolus and extending to the floor of the mouth. Occasionally, we see it primary in this location where it may be the result of a salivary calculus, a foreign body as a fish bone, or some other irritation. It usually starts as an indurated ulcer and is always serious, involving the gland early and infiltrating the tissues rapidly. Surgery is not very useful in this condition, and as a rule, we have to combine the electrothermic method with radium. The ulcer and all microscopic diseased tissue is destroyed with the current and curetted away. The base is then thoroughly gone over with the current, and radium needles are buried in the tissue about an inch apart all through the diseased area and allowed to remain from twelve to twenty-four hours. Again, careful attention must be given the glands in each case, and appropriate treatment, directed to destroy or control the disease present.

Cancer of the cheek is much more common than generally supposed, and occurs mostly in the posterior angle of the mouth, and around the opening of Steno's duct. In the early stages, we may have an ulcer resulting from a rough tooth, or a simple wrinkling of the mucous membrane with superficial induration. This eventually breaks down and ulcerates and infiltrates the tissues. At other times, it starts from a patch of leukoplakia. Almost invariably this condition is well advanced before a physician is consulted, due partly to the fact that there is no pain. The electrothermic method is indicated in this case, and we may destroy the growth completely without going through the cheek. The coagulated tissue is curetted away, and the base thoroughly sealed by the current followed with appropriate radium treatment to the glands, and frequently we must bury radium in the margins of the lesion after destruction with the current, as the disease is usually malignant in this location.

Cancer of the tonsils is a rapidly spreading and deadly disease. The symptoms are mainly a sore throat continuing over a long period with development of an indurated ulcer. The pillars are quickly involved and the glands show disease almost from the beginning. Because of the close proximity of the large vessels, the electrothermic method can not be used and surgery is frequently a difficult proceeding. The best results are obtained by use of radium needles in appropriate number and dose followed by thorough treatment of the glands as has been indicated. If possible, surgical removal of tonsils may be done first, followed by implantation of radium in the surrounding tissue.

Cancer of the antrum is usually an extension from a growth on the upper jaw. A decayed tooth is usually the starting point, and the disease soon extends into the antrum itself. Occasionally, we see this condition primary in the antrum. Every case of cancer in the upper jaw should be x rayed to determine the condition of the antrum, as frequently there are no symptoms to suggest it. The longer the condition exists, the more likelihood of the bone being diseased, and occasionally the disease involves the orbital plate and even breaks through into the orbit. It may also invade the ethmoid cells. Radical treatment is necessary and the surgeon would have to remove the entire maxilla, which is a serious and deforming operation. On the other hand, the electrothermic method may be used and the contour of the face preserved. The disease of the upper jaw is destroyed and a long sharp needle is used to carry the current into the antrum. The needle is inserted well up into the antrum and a strong current used until all the contents of the antrum are coagulated. Then the edges of the bone are removed with rongeurs and with a large curette the entire contents of the antrum are removed. There should be very little bleeding, but if it is excessive, the antrum is packed for a short time and then the remaining tissue is treated. Care must be had lest the orbital plate be destroyed unless it is already diseased. As a rule, we pack the antrum for a few days. It is also advisable in these cases to place a capsule of radium in the cavity for twenty-four hours. In a week to ten days all slough is usually loosened, and in six weeks all devitalized bone comes away. Healing takes about eight to ten weeks. This leaves a large opening into the antrum, but a properly fitting dental plate can be made with a pad to fill up the antrum and the results are very satisfactory. These cases are treated successfully, because, as a rule, there is no glandular involvement, unless the condition has been neglected. Occasionally the disease breaks through into the face. In this event, it is better to destroy the disease through the face under the eye as it gives better access and increases our chance.

Cancer of the lower lip is of frequent occurrence and is of a malignant nature. There is no reason why these cases should not be treated early, as the patient is usually aware of the lesion almost from the beginning. Yet, it is astonishing how people will neglect treatment until the condition has become a serious matter. The glands usually become involved early, although we do see cases which have existed for months without apparent glandular involvement. The first sign of trouble may be a dry scaly spot which may exist for months, but eventually it begins to infiltrate and later a small ulcer will appear. This frequently heals only to open again. It is at this stage, or before, that we should treat the condition and not later when the infiltration is deep and the ulcer breaking down with the gland already palpable. At other times, we may have a cracked lip which does not heal, a fever blister which remains, a spot of leukoplakia or a sore from a pipe or cigar. We must educate the laity that this is the time to seek treatment, if we hope to accomplish any improvement in our cancer statistics.

Once the lesion is fully developed, we may have an ulcerated indurated sore involving a small or large extent of the lip. Another form is the fungoid type where the malignant tissue grows outward. Infiltration may extend down the lip a considerable distance. If the corner of the mouth is involved, it is usually much more malignant and grows rapidly.

The surgical treatment involves removal of a wedgeshaped or square piece of the lip going well beyond the diseased tissue and with block dissection of the gland on both sides of the neck. At the present time, many surgeons do not look favorably on primary removal of the glands whether they are involved or not. The glands are nature's safeguard or filters, and if extension to the glands takes place the lymphatic vessels must carry the disease. Therefore, if the local lesion is removed and the glands also, what becomes of the disease in the lymphatic vessels? It drains into the tissues of the neck and the wound breaks down, as I have seen in several cases following operation. Something more than surgery is necessary, if we wish to be thorough Experience in a large series of cases has shown that a combination of the electrothermic method, radium and x ray will cure a large percentage of cancers of the lip where the glands are not already involved, and give far better results than any other form of treatment when the glands are involved. The technic is as follows: Because of the anatomical structure of the lip it lends itself readily to the use of local anesthesia, and accordingly we use a two per cent. solution of novocaine and infiltrate well beyond the diseased area. The local macroscopic disease is then thoroughly coagulated with the current, and in this way, we seal the blood and lymph spaces at once, and the intense heat penetration devitalizes certain cancer cells which may be just beyond the area actually destroyed. The coagulated mass is then cut out with scissors and without bleeding. The base is then gone over and again thoroughly treated with the current. The entire lip and neck are now marked out in squares about one and a half inches in size and a fifty mg. tube of radium on a half inch pad of gauze applied over each area for four hours. This latter is repeated in six weeks, and again six weeks later. If the glands are already involved, we bury from one to five radium needles in each gland and allow same to remain for twenty-four hours. This as a rule is not repeated.

By this technic, we have removed the local lesion, sealing the blood and lymph spaces, treated the lymphatic vessels in the lip and neck with radium and given appropriate treatment to the glands. It would seem, in this way, that all indications have been well met.

Cancer of the mouth is a large subject and has only been superficially treated in this paper, but it can well be seen that no one method of treatment will suffice for all cases, and to obtain the best results, we must use a combination of methods selecting those which in each case seem to meet the indications best.

In conclusion the following should be emphasized:

1. Removal of precancerous lesions of the mouth is the most important factor in the fight against cancer.
2. Early and proper treatment of cancer is essential for success.
3. No one method should be used for all cases, but a proper selection in each individual case, and more often a combination of two or more methods.
4. Many cases, previously considered hopeless, are now amenable to surgery, x ray, radium and the electrothermic method, either alone or in combination.

Medical Arts Building.

Hypermyotrophy of the Uterus (Reinicke)

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Many women between thirty-five and fifty years of age suffer from metrorrhagia and menorrhagia. Many are women who have borne a number of children or who have aborted one or more times. These patients suffer from no metabolic, poisonous, luetic, organic or infectious diseases, and a pelvic examination fails to reveal any distinct palpable lesion. After being subjected to repeated curettages, intermittent or continuous hemorrhage is still apt to continue.

The first attempt to place the etiology on a definite scientific basis was worked out by Scanzoni, who ascribed its cause to an atheromatous condition of the bloodvessels of the uterus. His contentions were subscribed to by Simonds, Cholmogroff, Solowij (24) and others, but it is my contention that the term arteriosclerosis cannot properly be applied to these cases.

In none of the cases were the patients suffering from any disease of the vital organs, nor did they show arteriosclerotic changes in the vessels of other parts of the body, not even in the pelvic vessels or the uterine artery. The pathological picture presented by the bloodvessels in the uteri removed differed materially from that seen in typical arteriosclerosis. In arteriosclerosis the morphological change commences in the intima and extends outward, while in these cases the growth of connective tissue was seen around the adventitia into which it finally extended. The media undergoes a muscular hypertrophy, probably compensatory, while the intima shows no deviation from the normal, with the single exception that occasionally there may be seen a slight increase in the epithelium. The bloodvessel lumina are kept wide open by the concentrically laid layers of connective tissue. In true arteriosclerosis there is a tendency toward the obliteration of the bloodvessel lumina by the growth of the intima. I venture to suggest that the term "hypermyotrophy," applied by Reinicke (3) is much more appropriate for the structural changes in the bloodvessels than arteriosclerosis.

In addition there is a great increase of connective tissue in the uterine walls between the muscle bundles, between the muscle fibres, and around the bloodvessels. As this increases there is a diminution of muscle structure from atrophy which shows here and there a hyaline degeneration. Much importance, says Novak (1) is attributed to the lack of elastic tissue and the hypertrophy of fibrous tissue in the muscle of the uterus. Pankow, quoted by Novak (1), describes the bloodvessel changes in the smaller vessels of the mesometrium as consisting of an increase in the elastic fibres of the vessels as well as the uterus itself. These changes were observed only in women who had borne children. Age played no part as they were found in quite young women.

ETIOLOGY.

The tendency among gynecologists in the past seems to have been to consider as arteriosclerosis, for want of a better name, all cases of uterine bleeding for which no other explanation could be found. It is obviously difficult and at times impossible to eliminate all possible causes of uterine hemorrhage. The question as to which of these findings, the bloodvessel changes or the connective tissue changes, is responsible for the persistent uterine hemorrhage in the preclimacteric period, seems to resolve itself into a hyperdevelopment of fibrous tissue in the uterine walls which takes the place of the exhausted and finally atrophied muscle fibres. With the diminution of muscle tissue and elastic fibres a loss of contractility occurs. This loss becomes greater after each succeeding pregnancy until uterine compensation is entirely broken. It is contended by Rabinovitz (29) and others, therefore, that the menorrhagia and metrorrhagia in these cases is due to an insufficiency and an inability of the uterine muscles to contract, and that it is not due to the friability or atheromatous condition of the bloodvessels. In other words, the bloodvessel changes are secondary to those taking place in the muscularis, as proved by the invasion of fibrous changes in the adventitia, by the compensatory hypertrophy of the media, and by the normal state of the intima. It is also contended that this condition is not the sequel of inflammatory reactions but is the result of biological changes.

Polak (2), on the other hand, considers this condition as practically always due to old infections of the uterus after repeated parturition or abortions with subinvolution and associated with metritis of a chronic type. The endometrium is a lymphoid structure without a submucosa. The prolongation of its tubular glands extends into the underlying muscular coat. In the course of time, says Polak, infective bacteria, in the form of serum, round cells, plasma cells, and leucocytes, are poured into the stroma and muscle structure. This thickens the wall of the uterus and increases its gross bulk. Muscle tissue is destroyed by pressure and its place is taken by fibrous tissue. The glands are larger and dilated. The arteries become thick walled and surrounded by a large amount of elastic tissue which inhibits normal muscular contractions from controlling the bloodvessels, hence bleeding is the most constant symptom, and Chalfant emphasizes the fact that the bloodvessels are increased in number and size.

Kelly is quoted as saying that it is a noteworthy fact that this disease is a local affection not associated with an arteriosclerosis of the other vessels of the body nor of the uterine artery itself. Arteriosclerosis cannot be considered as the essential and only cause of hemorrhage of this type. As a matter of fact, uteri in which a true atheroma of the vessels has been found have in a number of cases never had any pathological bleeding at all during the physiological life of the uterus. It is also possible that changes observed in the mucosa may be the result instead of the cause of the hemorrhage.

Fletcher Shaw (4), Seifert Saxinger, Olhausen and Finn all leaned toward the idea of subinvolution and chronic endometritis, but Hitschman and Adler disproved the occurrence of chronic endometritis except in rare instances. Fritsch, Cornil, and Pozzi all contributed articles and Theilhaber and Meier (5) elaborated the theory of "muscular insufficiency," asserting that any change in the endometrium was secondary to that of the myometrium. Quoting freely from Scott's (16) admirable review of the literature, Barbour (6), Hermann, Martin, and Rustner were all of the opinion that the main pathological change was one of arteriosclerosis, but Palmer Findlay (7) disagreed and went back to the idea of muscular insufficiency. Addinsell (8), Gardiner and Goodall (9) stated that any prolonged congestion caused hypertrophy or hyperplasia of muscular as well as connective tissue. If this is sufficiently prolonged the muscle fibres atrophy and the connective tissue predominates. Archibald Donald (10) opposed this idea believing that the changes in the endometrium were constant. Briggs and Hendry (11), after studying 104 cases, viewed the uncontrollable hemorrhage as a functional disturbance. Geist (12) and Novak also conclude that the bleeding is purely functional and that the causative factor is probably ovarian. Papers have also been contributed by Anspach (13), Von Lorenz (14), and Pantzer (15) suggesting that the menorrhagia may be purely functional.

HISTOLOGICAL FINDINGS.

From this summary of the literature it is obvious that the histological findings in cases of idiopathic uterine bleeding vary in the experiences of different observers and that there is no one constant finding. Most of the writers are agreed that a majority of the cases are of the subinvolution and chronic metritis type, with a thick walled and enlarged organ and with both the muscular and fibrous tissue increased. The bloodvessels are thick walled and there are large plaques of elastic tissue around many of them. But, says Scott (16), idiopathic bleeding also occurs from other types of uteri and it is not uncommon to find the small sclerotic uterus, or the large soft flabby one, bleeding just as profusely as the socalled fibrosis uteri. Moreover, it is possible to find many uteri exhibiting any or all of the described histological changes of vessels, musculature, and elastic tissue, and yet not be the seat of any abnormality in bleeding.

In the cases carefully studied by Scott (16) there were thirty-four which presented histologically all the earmarks of socalled fibrosis uteri, yet in which there occurred no pathological or abnormal bleeding. These uteri were removed in the course of operations for various pelvic conditions; eighteen were larger than usual, six were smaller than usual, ten were normal in size, and the microscopical findings varied as much as in the bleeding cases. The fibrous tissue was increased in twenty cases and normal in fourteen. The bloodvessels were thickened in twenty-four specimens, while in sixteen there was an abnormal amount of elastic tissue either in the wall of the vessel or just outside of it. The vessel walls were normal in eight cases, and yet all these thirty-four cases presented no abnormality of bleeding.

It is seen, therefore, that the histological findings of chronic metritis of fibrosis uteri are not present in all cases of idiopathic uterine hemorrhage, and in many cases where these changes are found and from our former reasoning patients who ought to bleed abnormally do not bleed at all. However, Scott (16) found that there was one histological finding constantly present and that was a glandular hyperplasia of the endometrium, the glands being greatly increased in size and number. He properly asks, "If there is no constant histological findings and the bleeding does not depend upon changes in the myometrium or the vessels, how is it to be accounted for?"

There are many things that seem to point to the fact that it is due to a disturbance of the endocrine equilibrium. It occurs only during menstrual life and always starts as a menorrhagia. It is particularly common to the periods of puberty and the menopause and it is at these periods that endocrine disturbances are most often abnormal. It often can be relieved by x rays or radium and the effect produced by these agents is primarily on the ovaries.

From a consideration of this rather exhaustive review of the literature on the subject, in which each writer has sought to prove his theory largely from the viewpoint of *post hoc, ergo propter hoc,* the idea is suggested to my mind that there are at least three different types of this condition. First, a large group, comprising probably the majority of cases which fall into the class of chronic metritis and consequent subinvolution. Second, the group of senile atrophy and contracted uterus, for it must be remembered that this type of idiopathic hemorrhage does occur after the menopause and these cases cannot be entirely ignored. It may also be true that atrophic changes may be taking place before the menopause is established. Third, a rather large class of cases that are distinctly of an endocrine type. These cases probably occur in women who in earlier years were accustomed to having free and prolonged flow as a normal habit, a great many of whom had never been pregnant or suffered from a miscarriage.

TREATMENT.

In a consideration of the treatment of this condition it is necessary to eliminate the presence of a submucous polyp, or a small intramural fibroid; the retained products of an old abortion, such as had been termed placental tumor; bleedings and congestions due to pelvic varicocele and cancer of the fundus. The differentiation between metritis and carcinoma is the most important and sometimes the most difficult problem that confronts the gynecologist. This question can be decided only by the aid of the curette and a microscopal examination of the scrapings by a competent pathologist. Indeed, hysterotomy may be necessary sometimes to determine just what condition exists inside the uterus. If the bleeding is of the idiopathic variety, curettement will control it temporarily, but usually after one or two periods the bleeding will begin again and often with increased severity.

X RAYS AND RADIUM.

Treatment may consist of x rays or radium, opotherapy with the endocrine glands, and if these fail, conservative surgery, which should be a supravaginal or panhysterectomy according to the indications. Radium and x rays would no doubt cure most of the cases and reduce the size of an enlarged uterus, but unfortunately not all of these cases are amenable to radium or x rays. If the pelvis has been the seat of previous inflammatory processes, such as peritonitis, salpingitis, or cellulitis, these agents are contraindicated.

ENDOCRINE TREATMENT.

Concerning endocrine treatment, Sehret (19) believed that hypothyroidism was responsible for many cases of excessive bleeding. The effect of mammary secretion upon the mechanism which causes menorrhagia or metrorrhagia has been suggested by Shober (17) and by Crouse. The whole question of the action of the endocrines is yet in such an experimental stage that it is quite impossible to make any dogmatic statements about them, but in my personal practice I have relieved many of these cases of metrorrhagia and menorrhagia by combinations of thyroid extract, posterior pituitary, mammary gland, and sometimes corpus luteum.

It is only fair to state, however, that where these glandular products have been effective has been in the cases in which there was little or nothing to denote chronic metritis or subinvolution, either in the history of the case or the examination.

Various writers have from time to time suggested one or more of these glands, but it is now well recognized that they accomplish little unless used in combination, because they work as a chain instead of individually. If the treatment by glandular extracts is carefully worked out in individual selected cases the results are sometimes brilliant, but on the other hand sometimes fail entirely. In the cases selected as purely functional this method is well worth a trial, because many of these women, especially the younger ones, will resent having their ovarian function completely stopped by radium or x rays, and if a result can be accomplished without resort to surgery it is much more acceptable to them.

HYSTERECTOMY.

Hysterectomy should be limited to those cases in which radium or x rays are not indicated, namely, in women whose pelves have been the seat of chronic inflammations with recurring exacerbations or other pelvic complications, and in the cases in which after a fair trial the endocrines have failed and the woman is drifting into chronic invalidism. If the cervix is scarred up with old tears, or there has been trauma to the lower uterine segment and the cervix is the seat of endocervicitis and in an unhealthy condition, then nothing short of a total hysterectomy is demanded.

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The author's references will appear in his reprints.

The Clinical Value of Acidophilus Milk

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In January, 1922, at the suggestion of Dr. F. G. Cottrell, of the National Research Council, and with the permission of Dr. Leo F. Rettger, of the Department of Bacteriology of Yale University, we undertook an investigation of the possible clinical value of acidophilus milk in gastrointestinal disorders. We have now used the milk and observed its effect, with only slight interruptions, for eighteen months and are able to report observations on eighty-four adult patients. Each of these patients has taken a quart of milk each day for a period of six weeks.

When this study was started it had been clearly shown by Rettger and Cheplin and their coworkers, by well controlled experimentation, that by the use of preparations containing large number of Bacillus acidophilus the human intestinal flora could be markedly simplified, that it could be changed from a preponderatingly Gram negative to a preponderatingly Gram positive type, and that gas producing and putrefactive organisms could be almost completely stamped out or replaced by the Bacillus acidophilus. This had been shown by both animal and human experimentation and the results found were most striking. They had also shown that this transformation or simplification of the intestinal flora could be accomplished by the ingestion of large amounts of glucose and lactose, these sugars apparently furnishing the necessary pabulum for the growth of the Bacillus acidophilus normally present in small numbers in the human intestine. This work indicated, however, that in order to accomplish this result, large amounts of these sugars, between two hundred and four hundred grams, were required each day. They had also shown that the same change in flora might be accomplished by the ingestion of large amounts of whey broth cultures, or by a combination of the latter with the sugars mentioned above. A third way in which the same result could be accomplished was by the ingestion of milk cultures of the organism, either alone or better in combination with lactose in amounts usable clinically.

As already pointed out it had been shown that larger amounts of lactose than seemed practicable were required to cause a transformation of the intestinal flora. The majority of our patients were below their ideal weight. We found, furthermore, that the milk could be prepared without great expense and more reasonably than broth cultures could be obtained. Because of these reasons we thought it more practicable to use the acidophilus milk.

In all but twenty cases we have had the patients use with the daily quart of milk seventy-five grams of lactose. This has seemed a valuable addition, enabling the change in flora to occur much more rapidly and effectively and enhancing the clinical value of the preparation. The twenty cases in which the patients did not receive the lactose are included under the discussion of constipation. In the cases of all other conditions discussed the patients received lactose.

We have not attempted extensive laboratory studies on the stools of patients before and after the use of the milk. In the few cases in which we have satisfactorily done this our findings have coincided with those of Rettger and Cheplin. The transformation from a Gram negative flora to a preponderatingly Gram positive one has been striking, rarely, however, going higher than eighty per cent. of Gram positive organisms. Gas production, as tested by fermentation of one per cent. dextrose broth in the Smith tube, has generally been reduced.

Patients as a rule have not objected to the taste of the milk. It has a mildly acid flavor, less acid than Bulgarian bacillus milk, and is quite acceptable as a food. Most of the patients have stated that they liked it. All of the patients, with the exception of a group of six with chronic diarrhea, were on an ordinary well balanced diet. In the group with diarrhea roughage and bulk were eliminated, in so far as was possible.

Each patient was first put through a complete examination, consisting of history, physical examination, gastric analysis, examination of the urine, feces and blood, and blood Wassermann, blood pressure determination, gastrointestinal x ray study, and proctoscopic examination. Diseases other than those mentioned below were not present in these cases.

CONSTIPATION.

Fifty adult patients presenting themselves for the treatment of chronic constipation were given the milk over a period of six weeks. Each of these patients had had constipation for many years, the majority stating that they had been constipated all their lives. All were in the habit of taking some form of laxative routinely, the majority, thirty patients, every day in the form of a pill, saline or enema. Twenty patients were given the milk without lactose, and the remaining thirty were given the milk plus lactose as stated above (seventy-five grams per day). Thirteen of the latter group were patients who had been in attendance at the office for a year or more and in whom a satisfactory result had not been obtained.

The results in general show that acidophilus milk with lactose has a distinctly laxative quality. The milk alone in our series, however, did not show such an effect. Of the twenty patients who took the milk alone, eight reported a constipating effect, six a laxative effect, and six reported no effect in either way. Of the thirty patients given the milk and lactose, twenty-four reported a distinctly laxative effect, none reported a constipating effect, and only six reported no effect in either way. Of this group of thirty patients twenty-four were below their ideal weight, as calculated on the basis of age, height and sex. The general tendency was toward a gain in weight. Of the group using the milk and lactose, sixteen were able to discontinue all laxatives; the remainder found it necessary to use mineral oil or agar, preparations milder than they had hitherto used. With such symptoms as debility, lassitude and depression, commonly attributed to constipation or autointoxication, it is difficult to be definite. It has seemed to us, however, that there was marked improvement in such symptoms coincident with the correction of constipation by these means.

EXCESSIVE INTESTINAL GAS.

Patients who seemed to be especially benefitted were those who complained particularly of an excess of intestinal gas, of flatulence, and of the passage of large amounts of gas by rectum. We have observed twenty-seven such cases. A majority of these came under the constipation group, although we have included eight cases in which constipation was not present. Patients of this group complained of vague symptoms, of a sense of fullness, of heaviness, of shifting abdominal pain, socalled gas pain, and of explosive passage of gas. The neurasthenic habitus is especially evident in this group. Drowsiness, lethargy, a tired feeling or a feeling of being below par, are also symptoms commonly present in this group. Of the twenty-seven patients complaining of excessive intestinal gas, twenty-three reported marked improvement and four noted no effect. No patient in this series reported an increase of symptoms. In this group twenty-four out of the twenty-seven were on the average below weight, and again the general tendency was toward a gain. Those reporting a reduction in the intestinal gas also reported an improvement in the other symptoms mentioned.

ULCERATIVE COLITIS.

The use of the milk and lactose, as described above, in a case of ulcerated colitis of two years' duration, had no appreciable effect.

FUNCTIONAL INDIGESTION ASSOCIATED WITH CHRONIC MYOCARDIAL WEAKNESS.

Five patients, all elderly individuals between sixty and seventy years of age, in whom the findings were those of chronic myocardial weakness, presented themselves because of intestinal gas and bloating. At times the abdominal distention was so great as to seem to embarrass further the already greatly embarrassed circulation. Relief from the digestive disturbances in these cases was marked in all five. Mild constipation was relieved, and in one case with high indicanuria and marked lethargy almost approaching coma, but with a normal blood chemistry study, the use of the milk was coincident with a rapid clearing of the lethargy and of the indicanuria.

CHRONIC DIARRHEA.

Six cases of chronic diarrhea were studied, in all of which repeated examinations of the stools revealed no parasitic cause for diarrhea. In no case was there an achylia gastrica present and, as already stated, routine examination revealed no organic or constitutional disease other than catarrhal inflammatory changes in the rectal mucosa on proctoscopic examination. These cases were diagnosed as chronic enterocolitis. The longest case had stood six years, the most recent case one month. The average duration of the six cases was eighteen months. Rest in bed and a diet deficient in roughage was also employed. In all these cases the patients made a rapid recovery and have remained well at the end of one year. In an additional chronic case where achylia gastrica existed no benefit was experienced from the use of the milk and lactose.

SPRUE.

Our experience with sprue has been limited to one case since employing the acidophilus milk. The result, however, was so striking that it seems the case should be recorded. This patient, a resident of Havana, Cuba, had had for two years the classical symptoms of sprue. For one month a routine of rest in bed, with a diet free of roughage, and treatment consisting of opiates by mouth and of colonic irrigations of salt and witch hazel solution, availed nothing. The patient, in spite of consuming large amounts of food, continued to lose strength and weight and received no relief from the diarrhea. At this point she was put on the acidophilus milk and lactose and a striking change occurred. Coincident with the use of the milk and lactose there was rapid and complete recovery. At the end of one year she remains in normal health. She gained in weight from ninety-five to one hundred and sixteen pounds while under treatment and informs us by letter that she has continued to gain. At the beginning of the use of the milk small doses of opium were continued. At the end of four weeks this was discontinued. Irrigations which she had been receiving every other day were discontinued one week after starting the milk. There was complete relief of glossitis, explosive, watery, frothy movements; anemia of the secondary type; emaciation and weakness.

In our opinion the acidophilus milk was responsible for the good result in this case of sprue and we feel that it is a form of treatment which could well be investigated by those handling large numbers of cases. Repeated routine examinations for ova and parasites were negative. Gram smears of the feces before use of the milk showed the following: Gram positive bacilli, twenty-one per cent.; gram negative bacilli, thirty-seven per cent.; gram positive cocci, twenty per cent.; gram negative cocci, twenty-two per cent.; gram positive organisms, forty-one per cent.; gram negative organisms, fifty-nine per cent. Six weeks after starting the milk and lactose the following was found: Gram positive bacilli, seventy-one per cent.; gram negative bacilli, nineteen per cent.; gram positive cocci, four per cent.; gram negative cocci, six per cent.; gram positive organisms, seventy-five per cent.; gram negative organisms, twenty-five per cent.

CHRONIC ECZEMA.

Four cases of chronic eczema were referred by dermatologists. These cases had not yielded to usual treatment and it was the feeling of the specialists who referred these cases that some form of toxic intestinal absorption might be at the basis of the eczema. Coincident with the use of the milk and lactose three patients recovered and one did not improve.

PSYCHONEUROSES.

In eight cases diagnosed as psychoaneuroses, the patients were given the milk and lactose in the routine way. All of these patients had been the rounds of medical men and were under the impression that their symptoms of depression and nervousness were due to autointoxication. Shifting abdominal pain, gas pain, irregular passage of mucus by bowel, nervous instability, more or less insomnia, introspection, were outstanding features in this group. In these cases four patients reported improvement and four reported no improvement.

At the end of six weeks' treatment all patients were advised to continue the use of the lactose and to date the majority have continued to do so. Our experience is that the continuation of this sugar maintains the new flora and the beneficial results obtained. On stopping the lactose there is a rapid reversal to the original type of flora.

For the preparation of the milk in the beginning of the work we are greatly indebted to the officials of the Hygienic Laboratory of the United States Public Health Service. During January, February, and March of 1922, this laboratory prepared the milk and cooperated in every possible way in the clinical investigation. Dr. George W. McCoy and Mr. Conrad Kinyoun, of the laboratory, report the following method of preparation: "Approximately nine hundred and fifty cubic centimetres of skimmed milk were placed in clean quart bottles, plugged with cotton and autoclaved for twenty to thirty minutes at fifteen pounds' pressure. Parenthetically, it is believed that twenty minutes is ample, and that much of the caramellizing of the lactose can be avoided by the shorter sterilization. The bottles were then cooled to 40° to 50° C. and inoculated with ten cubic centimetres of twenty-four hour acidophilus culture, the cotton plug replaced by an ordinary milk cap and incubated. At the end of sixteen hours the product was usually well coagulated, was transferred to 15° C., and kept in storage up to six days."

At this point the production was taken over by the Chestnut Farm Dairies, of Washington, D. C., and produced by the same method and without cost to the patients. To Mr. Henry M. Brauner, of this concern, we are greatly indebted. It has indeed been refreshing to see the management of a commercial concern cooperate wholeheartedly in a medical investigation. After two months' production the work was taken over by a local biological laboratory which has commercialized the product and has worked out the following scheme of production, the milk produced in this way being highly satisfactory: Quart bottles filled with fresh, unpasteurized skimmed milk are steamed at 100° C. for an hour on each of three successive days. After the milk has cooled below 37° C. it is inoculated with five to twenty c. c. of a culture. The amount of the inoculum depends on the speed of the organism. If the inoculum is fresh from the incubator the minimum amount is used. If it has been in the refrigerator for ten days or more the maximum amount is needed. The inoculated milk is then incubated for twenty-four hours at a temperature of 37° C. A lower temperature, requiring a longer period of incubation, produces a milk that is too acid, while the optimum temperature of 42° to 44° C., although it cuts down the time of incubation, makes a coarser product which is generally covered with whey. The method described produces a culture of fine flavor and texture without a trace of whey, unless the bottles are disturbed during the process of incubation. The milk is chilled for a day before it is delivered.

Further Observations on the Therapeutic Effect of Bacillus Acidophilus Milk

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INTRODUCTION

Since the announcement of the classical researches by Escherich, the discoverer of the Bacillus coli, the bacteriology of the intestinal tract has been a subject of a great deal of investigation. However, success in these endeavors has been limited, with few exceptions, chiefly to the discovery and systematic study of microorganisms which are manifestly disease producing and which exert their noxious influence upon the host within relatively short periods of time, as for example, the etiological agents of cholera, dysentery, typhoid and paratyphoid fevers. The more subtle microbic processes which are incessantly carried on in the alimentary canal, the various types of intestinal bacteria, their relations to each other and to the welfare of the host, their relative numbers, the laws which govern their metabolic activities and underlie their presence and physiological significance in the digestive tract, the ways and means which regulate the preponderance of one type of bacteria over another, represent researches into phases of intestinal microbiology which are, as yet, comparatively new, and the extremely vital importance of which is attested by the universal interest and concern which are manifested in them by the bacteriologist and medical man alike.

While it is, of course, true that the intestinal flora, ever harbored in the recesses of the bowel, is by no means constant ordinarily and, especially in case of disease, resulting from a direct invasion of pathogens, we are, nevertheless, now fully aware of the fact that under conditions of normal functioning within the alimentary canal, the intestinal flora is fundamentally a physiological unit rather than a heterogeneous collection of adventitious microbes and bears a definite relation to the diet of the host. In fact, under normal physiological conditions, the fundamental factor controlling the types of bacteria developing in the intestinal tract is the chemical composition of the food ingested. That is to say, as the chemical character of the diet is changed those types of bacteria which are unable to accommodate

TABLE I

The relation of the ingestion of B. Acidophilus Milk to the number of daily defecations.

Patient		NUMBER OF WEEKS											
		1	2	3	4	5	6	7	8	9	10	11	12
		M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S
1	Defecations	1 1 1 1 1 1	1 0 1 1 1 1 1	1 1 0 1 1 1 3	1 2 1 0 2 1 1	2 1 1 1 1 1 1	1 2 1 1. 1 3 1	1 1 1 1 1 1 1	1 1 1 3 1 1 2	1 1 2 1 2 1 1	1. 1 1 3 1. 1 2	1 1 1 1 1 2 1	1 1 2 1 1 1
	Formulae	1000 c c of B acidophilus milk plus 100 gms of Lactose throughout											
2	Defecations	1 1 1. 0 0. 1E	1 1 1 1 2 1 1	1 3 1 1. 2 1. 1	2 1 1 1 1 1 1	1 1 1 1 1 1 1	1 2 1 1 1 2 1	3 1 1. 1 1 1 1	2 1 1 1 1 1 1	1. 1 1 1 1 1 2	1 1 1 1 1 1 2	1 1 1 2 1 1 1	1 1 1 1 1 1
	Formulae	1000 c c of B acidophilus milk plus 100 gms of Lactose for first 10 days, thereafter the Lactose was increased to 150 gms per day.											
3	Defecations	1 0 0 1E 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 0 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1.
	Formulae	1000 c c of B acidophilus milk plus 100 gms of Lactose throughout											
4	Defecations	1 0. 0 1E 0 0	1E 2 2 0 0 1E 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1. 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1
	Formulae	1000 c c of B acidophilus milk plus 100 gms of Lactose throughout											
5	Defecations	1 0 0. 1E 1. 0	1 0 1 0 0 1E 1	0 1. 0. 0 1E 1 0	1E 1 1 1 0 1 0	1 1 0 1 1 1 1	1 1 1 1 1 1 0	1 0 1 1 1 1 1	1 1				
	Formulae	1000 c c of B acidophilus milk plus 100 gms of Lactose for first 21 days, thereafter the Lactose was increased to 150 gms per day											
6	Defecations	1. 1 1 1 1 1	1 1 1 2 1. 1 1.	1 1. 1 1 2 1 1	1. 2 1 1 1 1 1	2 1 1 1. 2 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 2	1 1 1 1 1 1 1	1 1			
	Formulae	1000 c c of B acidophilus milk plus 50 gms of Lactose throughout											
7	Defecations	1 0 0 1E 1. 0	1. 1 0 0 1E 1 0	1 1 0 0 1E 1 1	1 1 1. 1 1 1 0	1 1 1 1 1 1 1	1 1 1 0 1 1 1	1. 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1.	1 1 1. 1 1 1. 1	1 1	
	Formulae	1000 c c of B acidophilus milk plus 100 gms of Lactose for first 21 days, thereafter the Lactose was increased to 150 gms per day											
8	Defecations	1 1 1. 1 1. 1	1 1. 1 1 1 1 1	1 1 1. 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1. 1. 1 1	1 1 1 1 1. 1 1	1 1 1. 1. 1 1 1.	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1.
	Formulae	1000 c c of B acidophilus milk plus 100 gms of Lactose throughout											
9	Defecations	1 0 0 1E 1 0	0. 1E 1 0 0 1E 1	0 1 0 0 1E 1 0	1 1 1 0 1 1 0	1 1. 1 1 1 1 1	1 1. 1 1. 1 1 1.	1 1. 1 1. 1. 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1. 1 1 1 1 1 1	1 1 1 1 1 1
	Formulae	1000 c c of B acidophilus milk plus 100 gms of Lactose throughout											
10	Defecations	1 0. 0 1E 1 0	1 1 0 0 1E 1 1	1 1 1 0 1 1 1	1 1 0 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1.	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1. 1 1	1 1. 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1
	Formulae	1000 c c of B acidophilus milk plus 100 gms of Lactose throughout											
11	Defecations	1. 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 2 1 1 1	1. 1 1 1 1 1 1	1 1 1 1 1 1 2	1 1 2 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 2 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1
	Formulae	1000 c c of B acidophilus milk plus 100 gms of Lactose throughout											
12	Defecations	6 9 3 3 4 3	3 3 3 3 3 3 3	3 3 3 4 3 3 3	3 4 3 3 3 3 3	1. 1 2 1 1 2 2	1 1 2 1. 1 1. 2	1 1. 1. 1. 2 1 1	1 5 7 4 5 3 2	2 1 1 1 1 2 1	1 1 1 1 1 1. 1.	2 1 1 1 1 1 2	1 2 1 3 1 1
	Formulae	1000 c c of B acidophilus milk throughout											
13	Defecations	4 5 3 4 2 2	3 2 1. 2 2 2 1	1 1. 1 2 2 1 2	1 1 2 1 1 1 1	2 1 1 1 1 1 2	1 1 2 1 2 6 5	5 3 2 2 2 2 1	2 2 2 2 1 2 2	2 1 1. 2 1 1 1	2 2 1 1 1 2 1	2 1	
	Formulae	1000 c c of B acidophilus milk throughout											
14	Defecations	5 6 7 3 6 5	4 4 3 3 3 2 3	2 3 1. 1 1 1. 0	0 1 1 0 0 1 1	0 1 1 1 1 2 1	2 1 2 1 3 1 2	1 1. 2 1 1 2 1	1 1 1 1 2 1 1.	1 1 2 1 1 2 1	1 1 1 1 1 1 1	2 1 1 2 1 1 1	1 2 1 1 1 1
	Formulae	1000 c c of B acidophilus milk for first 4 days, 500 c c of milk culture for following 24 days; thereafter 1000 c c of culture per day											

themselves to the new nutritive environment tend to decrease in numbers, while more adaptable organisms take their place. The well established fact that diet exercises a most profound influence in determining the predominance of one or another type of bacteria vegetating within the enteric tract, led to investigations relative to the question of transforming and simplifying the ordinary mixed intestinal flora through diet in conjunction with the oral administration of properly qualified organisms or by the latter process alone.

The work of Metchnikoff is too well known to justify any elaborate account of it in this paper. Realizing the presence in the alimentary canal of extremely large numbers of bacteria, the influence which the unrestrained activity of these organisms might conceivably exercise upon the general health of the host, and appreciating, moreover, the failure to annihilate them through sterile diet, colonic irrigations, starvation and chemical antiseptics, Metchnikoff proposed to combat the pernicious toxicogenic bacteria by infecting the intestinal tract with lactic acid bacilli, namely, Bacillus bulgaricus. Metchnikoff's proposal to fight these intestinal proteolytic bacteria on their own battlefield by the introduction of an antagonistic microbic army, gave birth to an entirely new and interesting field of study, namely, bacterial implantation within the intestinal tract for therapeutic purposes. The view that the ingestion of Bacillus bulgaricus brings about a displacement of the harmful intestinal microbes, thus leading to an improved physical condition, gained a firm hold in the minds of physicians, scientists and laymen alike.

Repeated attempts by Cheplin and Rettger in their recent extensive investigation to establish Bacillus bulgaricus in the alimentary canal of albino rats and of man through the administration *per os* of extremely large numbers of this organism were entirely unsuccessful. At no time during the course of experimentation was Bacillus bulgaricus recovered from the feces of man or the white rats or from any portion of the digestive tract of the rats, irrespective of whether the organism was fed alone or with a utilizable carbohydrate, such as lactose. Cheplin and Rettger pointed out, however, that bacterial implantation within the digestive tube was possible and could be accomplished only when properly qualified organisms were used. The bacterium selected for this purpose was Bacillus acidophilus. They demonstrated that transformation of the fecal flora, resulting in complete implantation of Bacillus acidophilus may be brought about easily by the oral administration of proper amounts of, 1, lactose or dextrin; 2, viable whey broth or milk cultures of Bacillus acidophilus, or 3, a combination of lactose or dextrin and the acidophilus cultures, in which case the amounts of each were cut in half. The claim is made that Bacillus acidophilus is a normal inhabitant of the large intestine of both animals and man and constitutes a logical candidate for simplifying the fecal flora for therapeutic purposes, while Bacillus bulgaricus, on the other hand, is not, so far as is known or could be ascertained, of intestinal origin and will under no circumstances accommodate itself to the intestinal environment.

The belief that a change from the ordinary, mixed, proteolytic fecal flora to one strongly dominated by Bacillus acidophilus is both possible and desirable, afforded a new avenue of approach to this complex subject. Viewed from this angle, the question naturally arose as regards the extent of the possible therapeutic merits attached to an acidophilus predominating fecal flora. The observations of Cheplin and Rettger have shown that Bacillus acidophilus accomplishes the results that Metchnikoff ascribed to Bacillus bulgaricus. These claims were since confirmed by Cheplin and Wiseman, Kopeloff and Cheney, and Gompertz and Vorhaus, who reported satisfactory treatment of chronic constipation and diarrhea with milk cultures of Bacillus acidophilus reenforced with lactose.

Cheplin, Fulmer and Barney, in their studies on the effect of Bacillus acidolphilus milk in a series of cases of chronic constipation, diarrheas and mucous colitis, found that the milk culture, when taken in sufficient amounts, exerted a beneficial influence clinically by removing the toxic symptoms and regulating the fecal eliminations from the bowel.

In view of the encouraging results which I have obtained in my earlier experience in connection with the therapeutic effects of Bacillus acidophilus milk, it was deemed highly desirable to extend the observations on a larger group of clinical cases. The chief object in conducting the feeding experiments presented in this paper was to implant Bacillus acidophilus within the alimentary canal of man and, while

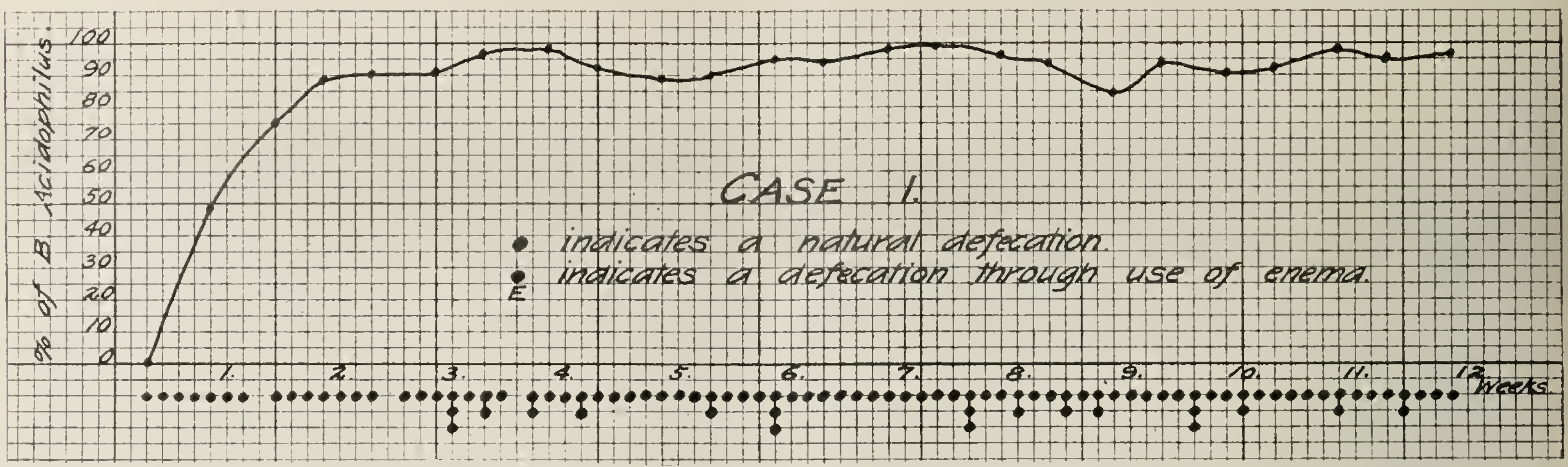

Chart. 1.—Case I. Constipation.

maintaining it as the dominant intestinal organism, to determine what improvements, if any, were manifested clinically. In other words, my aim was to establish, if possible, a correlation between a simplified aciduric flora represented strongly by Bacillus acidophilus and any changes which may be noted in the clinical picture.

In studying the therapeutic effects of the oral administration of Bacillus acidophilus milk, either alone or in combination with different amounts of lactose, no difficulty was experienced in enlisting the friendly cooperation and advice of practising physicians, who not only supplied me with many of the most interesting and severest cases, but who also furnished clinical histories of the individual cases and in several instances with x ray photographs. The subjects under discussion may be conveniently subdivided into the following two groups: 1, chronic constipation with the symptoms of socalled autointoxication and other accompanying disturbances, eleven cases; 2, chronic diarrhea and mucous colitis, three cases. These fourteen cases are exclusive of those which have come under my observation within the past six months. A full account of those results will be published at an early date. Particular attention is called to the fact that no patient was accepted for treatment except through advice by a practising physician.

METHODS

The subjects were requested to bring to the laboratory at least one specimen of stool before they were eligible for the acidophilus treatment. In all of the accompanying curves and Table I the first evacuation represents the stool furnished prior to commencing the acidophilus milk treatment. After the initial administration of the milk culture, with or without stated amounts of lactose, the patients were instructed to supply the laboratory with at least two specimens of stool each week. At no time during the investigation were any provisions or strict regulations made as to diet, except that the subjects were urged to refrain from the use of any food which by personal experience or training they knew to be likely to prove injurious. The milk culture and lactose, the amounts specified in Table I, were ingested in three equal doses, morning, afternoon and evening, two to three hours after meals, in addition to the ordinary daily dietary régime. The powdered lactose was added to the milk culture after the incubation period and the contents thoroughly shaken. It was definitely arranged with the subjects that no cathartics or laxatives be taken throughout the entire experimental period. In the event of no response during forty-eight consecutive hours, enemata consisting of two to three parts of water and one part of the milk culture were resorted to. In the diarrheal cases the treatment consisted in the daily oral administration of one thousand c.c. of the acidophilus milk without any added lactose, owing to the fact that this sugar, when taken internally in sufficient amount, exerts a marked laxative effect. Whenever the stimulation of peristalsis became too marked the volume of the culture taken daily was reduced to five hundred c.c. (Table I).

BACILLUS ACIDOPHILUS MILK

In view of the extreme importance attached to the use of Bacillus acidophilus milk the following brief description of the method of preparation and of its known properties is given.

Fresh skimmed milk is sterilized by autoclaving

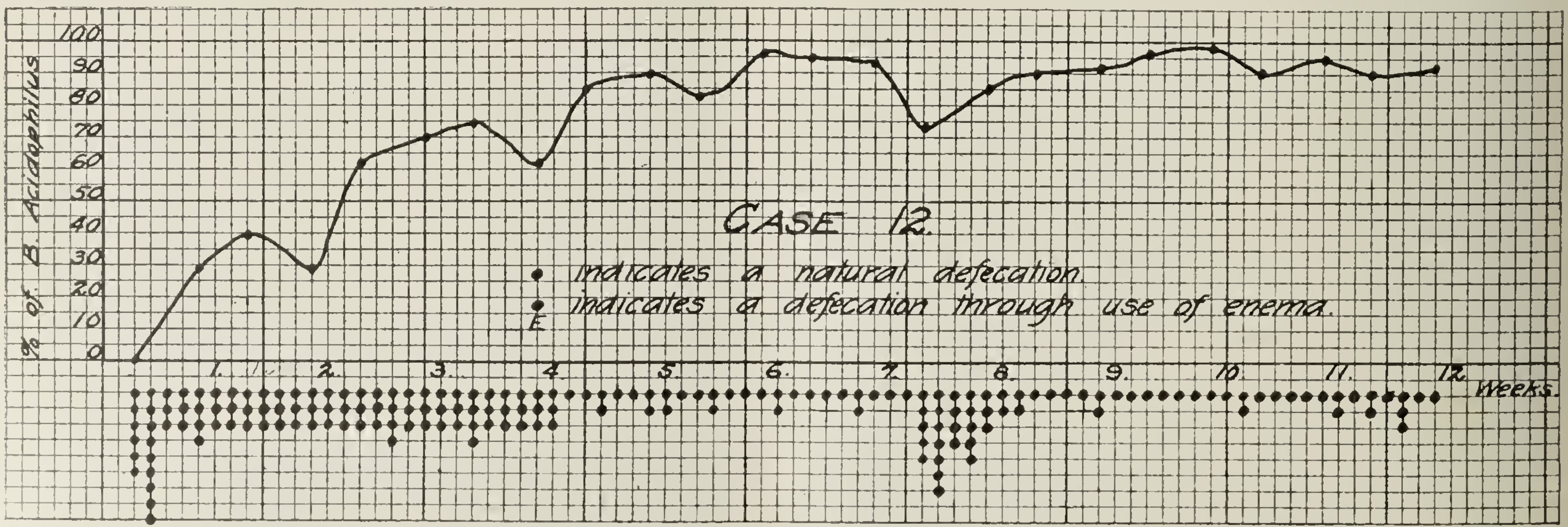

Chart 2.—Case II. Mucous colitis.

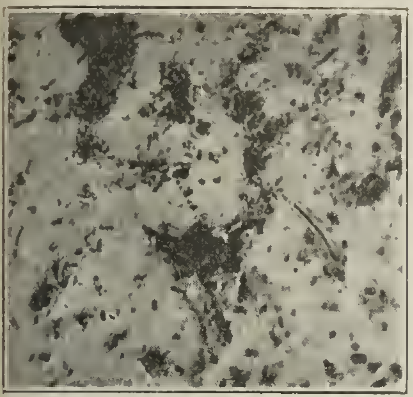

FIG. 1.—Gram stained film from fecal suspension before the administration of acidophilus treatment. Note complexity of intestinal flora. X 1000 diameters.

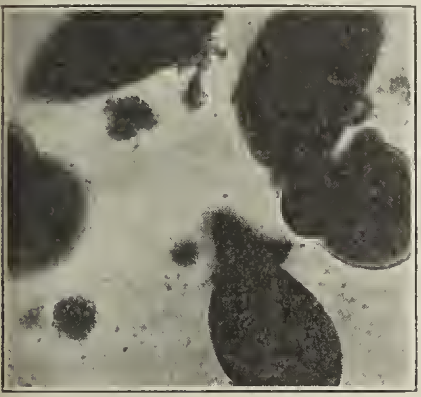

FIG. 2.—Two day old colonies on whey agar plate at 37°C. from fecal specimen two days after commencing treatment. Note small number of Bacillus acidophilus colonies, coarsely granular, fluffy, with very indeterminate wisp-like margins. X 40 diameters.

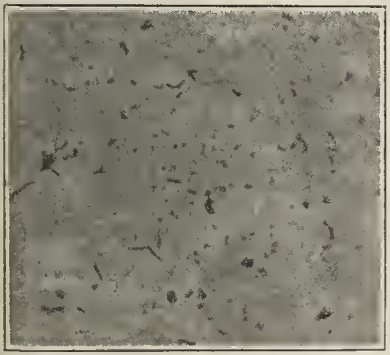

FIG. 3.—Gram stained film from fecal suspension four days after beginning acidophilus treatment. Note the simplified character of the bacterial flora dominated by acidophiluslike rods. X 1000 diameters.

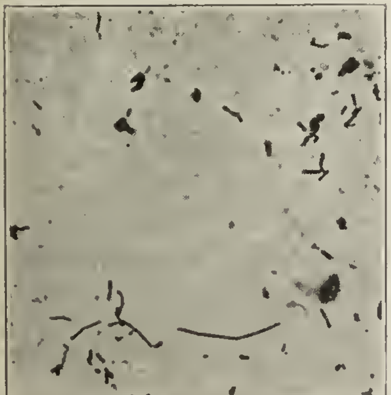

FIG. 5.—Gram stained film from fecal suspension eight days after beginning the acidophilus treatment. Note complete transformation of the intestinal flora. X 1000 diameters.

at an extra pressure of fifteen pounds for twenty to twenty-five minutes or longer when more than one thousand c.c are sterilized in a given container. For this purpose pyrex Erlenmyer flasks (fifteen hundred c.c. capacity) have been employed in the present investigation and were found to give admirable service. Properly heated milk should have a light yellowish cream color and not be distinctly browned. After cooling to at least 37°C. the milk is inoculated with a pure culture, preferably mixed strains, of Bacillus acidophilus and incubated at 35-37°C. for twenty-four to thirty-six hours. In this work six strains of Bacillus acidophilus were employed as the inoculum and at least ten c.c. of such inoculum are transferred for each litre of milk so treated. After the completion of the full incubation period, the milk coagulates and the casein appears as one solid block of curd, extremely soft in consistency, with a thin layer of clear whey over the surface. Upon thorough shaking the curd disintegrates into a finely subdivided state and the milk acquires a very smooth consistency which resembles that of rich cream. The acidity of Bacillus acidophilus milk is never high, as compared with that of ordinary Streptococcus lacticus or Bacillus bulgaricus milk, seldom reaching more than one per cent. The pure acidophilus milk possesses a decidedly characteristic odor and taste and should be agreeable to persons who do not ordinarily have a dislike for high grade buttermilks. The milk culture should be cooled after incubation, either in a cool room or refrigerator, clean and free from undesirable odors which may be absorbed, in order to enhance materially the palatability of the product. If it is found necessary to reenforce the acidophilus milk with lactose to insure maximum therapeutic effect in the shortest period of time, as is the case with individuals suffering from chronic constipation, the sugar may be added at the time the culture is taken. It will be expedient to agitate thoroughly the lactose and the milk culture and allow the mixture to remain for two hours or more in a cool place. This will permit a portion at least of the sugar to dissolve and thus reduce the gritty character of the lactose enriched milk.

The acidophilus milk is tolerated by most persons, even by those who are unable to retain the simplest diets prescribed for convalescents. In my experience with the acidophilus milk during the past three years, there were encountered individuals who could not tolerate sweet milk, raw or pasteurized, in any form, but who consumed acidophilus milk in quart lots daily for several months with complete impunity.

Upon ingesting one thousand c.c. of lactose enriched acidophilus milk, most of the patients complain during the initial four to ten days of a feeling of fulness, bloating or distention of the abdomen and abnormal flatulence. These undesirable symptoms, causing at times considerable annoyance to the patient, cannot, unfortunately, be avoided. The cause of these symptoms is quite apparent. The ingested lactose, by virtue of its incomplete absorption, when taken in amounts of one hundred grams or more, passes on beyond the ileocecal valve and into the colon, and is there vigorously attacked by the large gas producing bacterial army, particularly Bacillus coli and Bacillus welchii, with the evolution of enormous quantities of gas. As the transformation

FIG. 4.—Forty-eight hour colonies on whey agar plate at 37°C. from fecal suspension four days after initial ungestion of Bacillus acidophilus. Note the transformation effected under such dietary conditions and the dominance of acidophilus colonies. X 40 diameters.

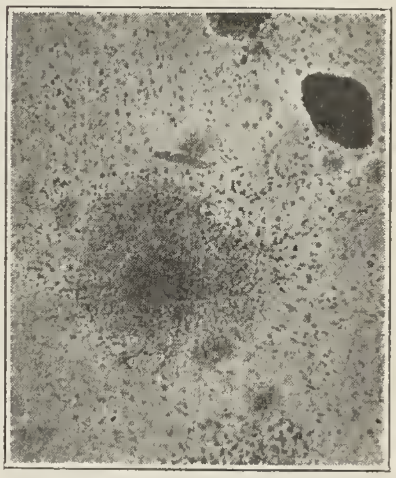

FIG. 6.—Two day old colonies on whey agar plate at 37°C. from fecal specimen eight days after the initial administration of the acidophilus culture. Note the marked transformation of the fecal flora and the predominance of Bacillus acidophilus colonies. X 75 diameters.

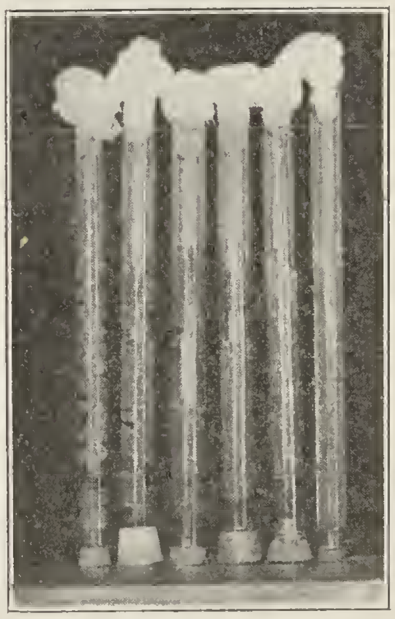

FIG. 7.—Veillon tubes. These tubes were used in my qualitative estimations of the relative amounts of gas produced by the fecal microbes. Note the gradual diminution of gas production, from left to right, as the intestinal flora approaches the mark of maximum transformation from the ordinary complex type to one in which the dominating organism is Bacillus acidophilus.

of the fecal flora progresses, with the concomitant diminution of the gas producing microbes, the aforementioned symptoms and distress gradually disappear. As long as Bacillus acidophilus, which is absolutely devoid of any gas producing properties, holds sway within the digestive tube, the amount of intestinal gases is highly minimized.

BACTERIOLOGICAL EXAMINATION OF STOOLS.

In all of the experiments recorded here the change in the bacterial picture of the intestinal flora and the implantation of Bacillus acidophilus were carefully determined by bacteriological examinations of the stools twice each week. The method employed was essentially the one advanced by Cheplin and Rettger and was briefly as follows: 1, Plating of fecal suspensions in saline on whey agar or dextrose agar (when the former was not available) and the numerical relationship of Bacillus acidophilus colonies to all other types expressed in terms of percentage. 2. Preparation of deep Veillon tubes for detection of gas producing organisms of both aerobic and anaerobic types. 3. Staining by the Gram method of fecal smears made on ordinary slides for a direct microscopic count and differential study of bacterial types. These methods, while short and simple in execution, proved to be most valuable and indispensable in this investigation, especially in the attempts made to correlate the bacteriological changes and the clinical findings. The accompanying curves and table demonstrate the relation between Bacillus acidophilus implantation and its tendency to regulate daily defecations.

EXPERIMENTAL BESULTS.

Throughout the entire series of experiments fourteen clinical cases were employed. The entire work involved the preparation of 1,100 litres of Bacillus acidophilus milk and the bacteriological examination of 310 stools. Brief clinical histories of all cases are given below together with treatment and results.

CHRONIC CONSTIPATION.

Case I.—The patient, white, female, engaged in stenographic and secretarial work, presented a history of most obstinate constipation for at least eight years, complaining of fullness of the abdomen, of gas and pain in the epigastric region, of an almost constant headache, general discomfort after meals accompanied by a peculiar feeling of malaise and dizziness, of visual disturbance, loss of energy and initiative, melancholia and other indications of considerable lessened mentality. It was absolutely necessary for her to resort regularly to unusually large doses of various cathartics and laxatives as well as colonic irrigations in order to induce bowel evacuations. She stated that for the past fourteen months the use of drugs and enemas yielded only partial relief of very short duration.

Treatment consisted of daily oral administration of one thousand c. c. of Bacillus acidophilus milk to which one hundred grams of lactose were added. Patient was under treatment for twelve weeks.

Result.—Subject responded immediately, reporting a normal bowel movement after the first litre of the milk culture was ingested and continued to report at least one daily evacuation, barring three exceptions, for the remainder of the experimental period. During this period the subject also reported two stools a day on ten different occasions and three defecations on four other separate days. There was an apparent change within the first two weeks in the patient's general condition and by the end of the tenth week said she had complete relief from gaseous distention and pain and discomfort in the epigastric region. Her headaches and mental and visual disturbances disappeared and she resumed her daily duties with, as she repeatedly stated in person, new strength and endurance. There was an increase of eight pounds in body weight and the patient reported a continuance of satisfactory bowel movements three weeks after the discontinuance of the Bacillus acidophilus milk.

By referring to the graph it will be clearly seen that within twelve days the fecal flora was markedly transformed, strongly dominated by Bacillus acidophilus. Attention is called particularly to the correlation which exists in this case between the simplification of the intestinal flora and the first noticeable improvement in the clinical picture.

CHRONIC DIARRHEA AND MUCOUS COLITIS.

Case II.—The patient, a white female, had been engaged in relief work in the Near East for three years. While there she was seized in 1919 with an attack of acute diarrhea accompanied by tenesmus. The stools contained considerable mucus and at times were quite bloody. After recovery she returned to the States in 1920. During the following year she experienced two recurrences of most violent diarrheal attacks accompanied by large amounts of mucus. It was not at all uncommon to record as many as eighteen movements a day. She was emaciated and subject to acute pain in the descending colon. The bacteriological examinations were negative for Bacillus dysenteriæ. She was sent to my laboratory following an attack of profuse diarrhea and the first stool presented was watery, of pronounced putrefactive odor, of greenish dark color and contained considerable mucus. The bacterial flora consisted chiefly of Bacillus coli and many other slender gram negative dysenterylike rods. Bacillus welchii and enterococci were also in abundance.

Treatment consisted of one litre of plain Bacillus acidophilus milk administered daily. The patient was under observation twelve weeks.

Result.—On the day previous to commencing the treatment the subject reported six movements and twenty-four hours following the initial ingestion of the litre of the milk culture the condition was somewhat aggravated, the patient asserting that she voided nine specimens with increased amounts of mucus and some blood. By the third day the number of stools decreased to three, appearing lighter in color and less watery. She continued to void three and occasionally four specimens a day for the next three weeks. By the end of the fourth week the abdominal pain and distress had practically disappeared, the diarrheal condition and mucus had almost completely ceased, and the stool became normal and formed. She continued apparently normal for three weeks reporting one or two defecations a day without blood or mucus, although in a few stools mucus could be demonstrated microscopically. Beginning with the eighth week there was a slight return of the diarrheal conidtion, not attended, however, by any blood or mucus. The subject confessed that on the night before the partial recurrence she indulged freely in various foods including excessive portions of meat, pastries and sweets. This setback lasted four days and a return to formed stools was evidenced for the remainder of the course of the feeding experiment. Except for the aforementioned recurrence she was, according to all appearances and information, and her own claims, in normal health for the rest of the experiment. The transformation of the fecal flora was complete after the fifth week. There was an increase in weight of ten pounds. The subject has on two occasions, six weeks after discontinuance of treatment, informed me that she has suffered no serious recurrence.

EVALUATION OF THE BACILLUS ACIDOPHILUS THERAPY.

From the general observations throughout this investigation I feel confident of the therapeutic value of Bacillus acidophilus in the treatment of the intestinal conditions set forth in this paper. That it readily lends itself to complete implantation within the human alimentary canal to the exclusion of almost all other types of intestinal microbes is now a well established fact. Its successful acclimatization and colonization in the large intestine, where the bacterial cesspool is most active, is of extreme importance both from prophylactic and therapeutic points of view. The acidophilus milk, by virtue of the large number of viable organisms which it contains, exerts a marked beneficial influence upon constipation by regulating the fecal eliminations from the bowel, while in the diarrheas and in mucous colitis its effects are manifested by a gradual restoration of formed stools and the elimination of mucous discharges. Simultaneous with these regulatory phenomena important changes are noted clinically. There appears a pronounced relief from the toxic symptoms which previously existed. This bears a definite and consistent relationship to the simplification of the intestinal flora. In my entire experience I have not, as yet, observed a single individual manifesting even a tendency toward constipation while harboring an acidophilus dominating flora.

Bacillus acidophilus is not a toxicogenic organism. No toxic or other harmful substances are ever elaborated from its metabolic activities. It is now well known that Bacillus acidophilus is present in large numbers in the digestive tract of normal nurslings, whose resistance to intestinal toxemia is at the lowest possible ebb, and it would appear, therefore, that its chief function is to confer protection upon the young against the invasion of numerous putrefactive toxin elaborating bacterial types found in adults. The virtue of Bacillus acidophilus, as a remedial agent, lies not only in its ability to suppress Bacillus coli, as affirmed by Gompertz and Vorhaus, but also to a very large extent to its inhibiting effect upon Bacillus welchii, Bacillus proteus, Bacillus putrificus and various other undesirable toxicogenic intestinal microbes.

In view of the conclusive evidence obtained from the numerous experiments which I have thus far conducted, it appears that viable acidophilus milk cultures of proper concentration, when taken *per os* in sufficient quantities and under optimum conditions, merit their therapeutic application in the treatment of chronic constipation, diarrheas and all their attendant symptoms. It would also seem logical to assume that Bacillus acidophilus milk should prove beneficial, not only in the treatment of pathological conditions which are directly or indirectly referable to a disturbed function of the main mechanism of elimination, but also in specific intestinal infections, as, for example, typhoid, paratyphoid, Bacillus enteritidis (Gaertner), cholera, and dysentery. Torrey has demonstrated in his studies with typhoid patients that the ingestion of two hundred and fifty to three hundred grams of lactose a day in addition to the other elements of the Coleman-Shaffer diet, which effected a marked proliferation of Bacillus acidophilus, conserved body weight, modified the course of the disease, and reduced the mortality.

The profound influence which Bacillus acidophilus exerts upon the activities of intestinal bacteria, in so far as it is now known, would, indeed, warrant the assumption that a new chapter in the annals of therapeutics has been opened. The results of this investigation are apparently favorable for a new avenue of approach to this type of bacteriotherapy. However, to sound a word of warning and caution at this time should not be amiss. We need but recall the socalled epoch making work of Elie Metchnikoff on the prolongation of human life through the removal of the injurious putrefying intestinal microorganisms by ingesting cultures of Bacillus bulgaricus. His advocacy of the use of Bacillus bulgaricus, "the longevity bug," has spread to every corner of the earth. In fact, so general has the use of the Bacillus bulgaricus cultures become that the market is actually flooded with various commercial preparations, in the form of powders, bouillons and tablets.

The claims of Metchnikoff and his colleagues were not confirmed, however, by many investigators who have shown conclusively that Bacillus bulgaricus does not acclimatize itself in the large intestine, where the microbic army is at its highest point of concentration and metabolic activities. It should be borne in mind that in the experiments conducted by Metchnikoff and his followers large quantities of milk soured with Bacillus bulgaricus were consumed and hence the conditions for the development of Bacillus acidophilus were most favorable, as has been clearly set forth by Cheplin and Rettger in various publications. Since Bacillus acidophilus, the normal inhabitant of the lower levels of the intestinal tract of man, closely resembles and is practically indistinguishable from Bacillus bulgaricus morphologically and even culturally to a very large extent, it is not illogical to assume that the former has undoubtedly been mistaken for the latter. This assumption is highly strengthened by referring to the observations made by Belonowsky, an associate of Metchnikoff, who noted that the intestinal flora of young nursing mice was of the same character as in older mice which received the Bacillus bulgaricus milk cultures. I examined the feces of nursing mice on several occasions and found large numbers of Bacillus acidophilus.

It would seem expedient, in view of the past history of bacteriotherapy and particularly the fate of Bacillus bulgaricus, to call attention to the fact that the Bacillus acidophilus therapy does not represent a cure for all diseases to which man is heir. Moreover, no claim is made that all cases of pathological disturbances falling within the category outlined above will necessarily respond to the acidophilus treatment. In many cases it may require considerable time, anywhere from two to six weeks, before any improvement is noted clinically.

VALUE OF TREATMENT.

The acidophilus treatment is not a panacea, nor an elixir of life. The administration of small amounts of cultures of Bacillus acidophilus in tablespoonful or tablet doses, unless extremely concentrated by special processes, should not be expected to effect transformation of the fecal flora and yield beneficial results.

Bass has shown the impracticability of commercial tablets and capsules. He estimates that it requires twenty tons of tablets or capsules to contain as many viable bacteria as are present in one litre of the Bacillus acidophilus milk culture. More recently, Cheplin, Post and Wiseman examined a large number of commercial tablets and their bacteriological findings fully confirm those of Bass.

The proper execution of this method of treatment involves the daily ingestion, for varying periods of time, of at least fifty billions of viable acidophilus bacilli. It is for this reason that I strongly urge the use of the acidophilus milk culture, in amounts to be governed by the response of the individual cases. This definitely established quantitative relationship between the number of living bacterial cells ingested and the bodily improvement which one wishes to attain should ever be kept in mind in order to insure the fullest benefits from the Bacillus acidophilus therapy and preclude its falling into ill repute.

The author's references will appear in his reprints.

Hematosalpinx Associated with Ruptured Tubal Gestation

By LAMBERT ROGERS, M.R.C.S. Eng.,
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Late House Surgeon, The Middlesex Hospital.

Rubinovitz and others have drawn attention to the fact that tubal gestation is not infrequently associated with disease of the opposite Fallopian tube which may be the seat of hydrosalpinx, pyosalpinx, or hematosalpinx. This is illustrated in the following case which also affords another instance of the curious circumstances in which rupture of a gravid tube may occur.

Case.—A widow, aged twenty-nine, was seized with abdominal pain when in a music hall on Tuesday evening, September 20, 1921. She was obliged to leave on account of her distress, was brought to hospital in a taxicab, and admitted into one of Mr. Webb-Johnson's beds. It was ascertained that she had been operated upon for appendicitis in November, 1917, and for renal calculus in September, 1918. She was a thin woman with a careworn expression giving her an appearance of being prematurely aged. The lower abdomen was tender on palpation and she had slight vaginal bleeding.

There was a history of two miscarriages, one at three and a half, the other at six and a half months, but she was the mother of two healthy children, and had been a widow since May 30th. Menstruation had been regular until July. On the 16th of that month she commenced to menstruate normally, but missed the whole of August and began again on September 2d. Since that date there had been bleeding up to the time of admission. Pain in the lower abdomen, most acute in the left iliac fossa, was first noticed on the Saturday before admission. On Sunday she vomited and had a transient attack of pain. On Monday she felt better and was free from pain, which, however, returned on the Tuesday evening when she was in the music hall as related.

Suspecting leakage from a gravid fallopian tube I kept her under observation. The morning following admission into hospital she felt so much better that she asked permission to go to her home, but was advised to remain until the next day. At 5:30 p. m., it was obvious that she was suffering from profuse internal hemorrhage. I opened the abdomen in the midline and on incising the peritoneum blood rushed through the opening. Introducing my hand into the pelvis I seized the left tube from which blood was spurting while my assistant completed the peritoneal incision. Then clamping the tube, we removed the greater part of it, leaving the ovary. The right tube was distended, as well as the left, and contained blood clot, and my colleague, who was assisting me, remarked that surely it was gravid also. We removed the right tube and ovary. The appendix was healthy and pelvic in position, despite the appendicectomy of 1917.

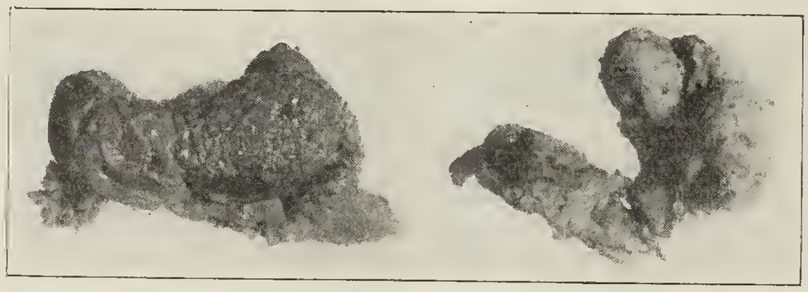

FIG. 1.—The two fallopian tubes seen from behind. The left is gravid, the right shows old salpingitis and contains blood clot.

After removing the clot and fresh blood from the colonic cavity, the abdomen was closed without drainage. Primary union occurred; the patient made an uneventful recovery, and left the hospital convalescent on the fourteenth day after the operation.

The illustration shows the two tubes from behind, the left contained chorionic villi, but I could not demonstrate these in the right which showed old salpingitis and contained blood clot.

I am indebted to Mr. A. E. Webb-Johnson for permission to record this case.

A Case of Bilateral Thromboangiitis Obliterans*

By M. J. STONE, M.D.,
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This case herein reported is considered of interest because of the development of arterial changes in one limb while under observation and treatment with apparent clinical improvement in the other limb. Also because it contrasts the effect of amyl nitrite inhalation on a bloodvessel recently involved against one in which adventitious and perivascular fibrotic changes had occurred.

CASE.—The patient, Mr. A. W., forty-one years of age, white, Lutheran, was a native of Esthonia (Finland), a sailor until ten years ago, and painter since then. His family history is not known. He was admitted to the medical service of Lebanon Hospital on March 15, 1922, complaining of severe pain in the small toe of his left foot. This was gradual in onset, beginning two months before, becoming progressively worse, and was aggravated by inclement weather and locomotion. Soon after the onset of pain, the patient noticed redness and moderate swelling of this toe.

The present illness dates from a year ago, when he experienced a burning sensation in the sole and all the toes of the left foot, starting originally in the big toe, spreading to the others. While undergoing treatment for this condition, he developed intermittent cramps in the left calf after walking (intermittent claudication). This symptom persisted up to and including the time he was admitted to the hospital. There were no constitutional symptoms.

He had pneumonia twenty-two years ago with hemoptysis, the entire illness lasting four months. He has been troubled with cough and expectoration for the past fifteen years. Two months after recovery from influenza, three years ago, he suffered from an attack of acute rheumatic fever and from that time, for a period of one year, he had palpitation of the heart every morning lasting about fifteen minutes accompanied by slight dyspnea and precordial pain extending occasionally to the left arm. He had a Neisser infection twelve years ago and denied lues by name and symptom.

He smoked moderately, about ten to twenty cigarettes a day, and subsisted on an ordinary full diet.

Physical examination, on admission, revealed a well nourished and well developed adult white male in the fourth decade of life, suffering acute pain. The eyes reacted sluggishly to light. There was a soft blowing murmur heard best at apex, accompanying and replacing second sound, heard best in sitting position, disappearing when breath was held; occasional extra systole heard. This latter sign has since disappeared. There was dullness at the right apex posteriorly, sibilant râles at end of inspiration heard over right chest posteriorly. The left small toe was red, swollen and tender with a small area of gangrene at the tip. The left big toe showed evidence of previous involvement by scaling and redness of skin. Other toes of left foot reddened, the typical rubor indicating a chronic compensatory capillary dilatation (1). The left foot was colder than the right. There was no pulsation of left dorsalis pedis obtainable, artery felt thickened and firm. Right dorsalis pedis artery was definitely pulsating. When both legs hung over the side of the bed, the left became markedly red over all toes and sole, limited sharply on dorsum.

Traces of lead were found in the urine on two examinations. Wassermann reaction was negative and blood chemistry gave normal figures. Spectrum was negative for tuberculosis.

The treatment consisted mainly of intramuscular injections of thirty per cent. sodium citrate solution five c. c. every other day, and alternate hot and cold foot baths.

His condition gradually improved as evidenced by relief from pain, sleeping through the night, lessened swelling and redness. However, two weeks following admission, pulsation in right dorsalis pedis artery had disappeared. The patient noticed cramps in the right calf for the first time the day previous, after walking, and pain in the toes of the right foot, especially the fourth toe. Amyl nitrite inhalations brought back pulsations in the right dorsalis pedis artery, but none in the left and at the same time it was noted, after taking the drug, that the capillary field showed more engorgment in the right foot than in the left foot. Treatment changed to intravenous administration of sodium citrate, 200 c. c., two per cent. every other day and amyl nitrite inhalations twice a day. Examination showed the right foot anemic, colder than the left, and the fourth toe quite blue at tip, apparently too early for compensatory capillary dilatation. There was absolute ischemia of both feet in the elevated position nor did blood return to the toes even after digital pressure applied to them had been released (compression test). As the feet were brought from the elevated (vertical) position toward the horizontal plane, the blood rush appeared earlier on the right side than on the left. On the right side, the more recently involved, an induced rubor was produced by depressing the limb, appearing earlier than the chronic rubor or erythromelia in the other foot which harbored the older process. For this reason the angle of circulatory sufficiency on the right side was less than on the left, 50 degrees on the right. 80 degrees on the left side. As the leg was slowly depressed from the elevated position toward the horizontal plane, a red color gradually replaced the blanched appearance. Assuming an imaginary line drawn through the limb in the vertical position, the angle formed by this line and the extremity moving from it toward the horizontal, at the first sign of return of blood denotes the angle of circulatory sufficiency (2).

When both feet were held in the dependent position over the side of the bed, the rubor of the left side became more pronounced but the right side was relatively unaffected and appeared quite anemic in contrast.

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*Read before Lebanon Hospital Alumni Society, April 18, 1922.

Blood pressure taken at this stage of the disease at the right popliteal space was 130-85 and not obtainable on the left side. One month before he was discharged, the patient complained of a tingling sensation and purplish discoloration of his left thumb. I found that the pulsations in the left dorsalis pollicis had disappeared but after inhalation of amyl nitrite promptly reappeared. The inhalations were now increased to twice a day, intravenous sodium citrate and alternate hot and cold foot baths were still being used. When discharged from the hospital, he could walk without pain and the tingling sensation in his thumb was much reduced. At present he is employed as carpenter and painter in a ship building corporation.

In making the diagnosis, the possibility of this being either arteriosclerosis or Raynaud's disease was considered. Two x rays of the feet, negative for arterial and bone change, the sudden involvement of the right foot within twenty-four hours, the spreading of the disease to the left hand, the normal blood pressure with the difference in pressures noted in the popliteal spaces and the absence of renal involvement make arteriosclerosis highly improbable as a causative agent.

The pain and vascular changes are paroxysmal and spasmodic in Raynaud's disease and x ray quite early shows disturbance of outline of the bone (a neurogenic trophic phenomenon similar to those of the vascular system) neither of which changes were present in this case.

Regarding the rapid blood return noted on the right side after inhalation of amyl nitrite two main factors responsible for this phenomenon will be considered below. In the first place, the arterioles and capillaries in the right foot had not yet reached their full capacity for dilatation, the process being recent as compared to that on the left side where the response to further depressor influence by the drug was feeble because of their continued state of engorgement and dilatation. Secondly, the right dorsalis pedis artery resumed its function because it was unhindered by mural or perivascular fibrosis, late pathological changes which must have been present on the left side to have restricted its elasticity by decreasing its muscle elements (upon which the drug directly acts) and preventing free movement by adhesions to surrounding tissues.

From the study of our case, we are inclined to believe that notwithstanding our inability to check the progressive course of the disease as regards new sites of attack, it is frequently possible by appropriate treatment to ameliorate markedly its clinical manifestations at the local areas involved.

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The Steinach Method as Applied to Women*

Preliminary Report

By HARRY BENJAMIN, M.D.,
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The knowledge of Steinach's researches and of the operation that bears his name has spread considerably during the last two years and reports of cases of more or less successfully performed vasoligations are appearing in the medical literature in increasing numbers. I, myself, have operated up to the present time on sixty-two patients. The reports of these cases, however, are not the subject of this article, inasmuch as a number of them are too recent to warrant their publication. I should like to discuss briefly, the indications that led me to perform the operation and which—to my knowledge—have not been classified before, in exactly this manner. According to the indications for this endocrine surgery, I have divided my cases into three groups.

Group I.—Congenitial inferiority of the endocrine system, especially hypogonadism. In this group I have operated upon a certain number of relatively young men suffering from eunuchoidism and sexual impotence due to dyshormonism.

Group II.—Cases of acquired endocrine weakness, due in part to overwork and generally termed neurasthenia, principally affecting the adrenals. Only those cases were selected where marked endocrine disturbances were present, together with a hypofunction of the gonads. Most cases of so-called premature senility would fall under groups I and II.

Group III.—This last group comprises the cases of actual senility. The patients were men in the seventies and more.

As an interesting feature regarding the question of the class of people that have undergone the operation, I might add that nearly thirteen per cent. of my patients were physicians; among the remaining cases, there were three dentists, eleven professional men, twenty-seven business men, eleven laborers and mechanics, one municipal officer, and one artisan. Evidently in other reports on the Steinach operation, for instance, by Robert Lichtenstern, of Vienna, Peter Schmidt, of Berlin, and Knud Sand, of Copenhagen, similar statistics could be compiled. It seems, however, that among the reports available there are fewer professional men and decidedly fewer physicians.

Regarding the application of the Steinach method to women by x ray exposures of the ovaries and the regeneration of the female puberty gland, I present the following preliminary report of my own experiences. Other clinical reports on this subject are so far lacking in the literature, but I know from verbal communication that, for instance, Dr. Manfred Fraenkel in Berlin, has had quite remarkable results and is at present engaged in preparing their publication.

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*Read before the New York Academy of Medicine, October, 1923, under the auspices of the German Medical Society.

The term female puberty gland was given by Steinach to those histological structures of the ovary which are held to be responsible for its internal secretion. There is still a great divergence of opinion in regard to these structures, and I shall therefore not go into the details of the different theories which have been advanced by the various investigators. However, there seems to be little doubt that the interstitial cells of the ovary, as well as the corpus luteum, are both hormone producing elements of the ovary.

In his book on *Rejuvenation*, published in 1920, Steinach devotes only a brief chapter to the method of the combatment of age in women. He mentions the possibility of transplantation methods, for which, however, great limitations exist, mainly on account of the difficulty in procuring suitable material. Reports of cases where such transplantations of ovaries were carried out are somewhat contradictory. For instance, Tuffier's experiences, reported in 1921, contain little encouragement for the homoplastic methods. Morris, however, as far back as 1906 reported quite successful operations.

Steinach has now conducted extensive experiments, together with Holzknecht, in Vienna, with a treatment of ovaries by x rays. Carefully exposing the ovaries of young guineapigs to x rays, a pronounced hypertrophy of the interstitial cells was produced which caused a corresponding premature maturity of the female secondary sex characters in those youthful animals. Apparently, a very strong stimulation of the production of gonadal hormones had been accomplished. Comparing the histological structure of the ovary on a section before and after x ray exposures, a marked degeneration of the follicular apparatus and a distinct increase in interstitial cells was seen. In connection with these animal experiments, Steinach asked Holzknecht to inquire about the state of health of those of his patients whom he had treated with x ray exposures (for tumors of the uterus, or climacteric hemorrhages), producing a therapeutic x ray castration. The inquiry revealed the fact that this form of castration was quite different from the surgical castration, since the expected signs of a quicker appearance of symptoms of senility were not noticed. Furthermore, the positive improvement in these women was so conspicuous that it could hardly be attributed alone to the cure of the original ailment, although this had generally been regarded as the cause of the beneficial result. Holzknecht reported that in these women the lassitude had disappeared and full physical and mental vigor had been restored; a decidedly more youthful appearance had been noticed, as evidenced in the better circulation and greater firmness of the skin. Considering the animal experiments, Steinach concluded that an unintentional incretoric stimulation of the ovaries had been produced in these patients, causing in turn a general stimulation of the entire endocrine system. Aside from the cure of the uterine trouble, this stimulation accounted for the remarkable clinical improvement. Steinach, therefore, as far back as in 1920, thought of the possibility of combatting age in women by the x ray treatment of the ovaries.

Within the last year and a half I have had a number of women treated with x rays, with the special purpose of combatting beginning or pronounced symptoms of age. Disturbances of the menopause have been treated quite frequently in recent years with x ray stimulation of the ovaries, and following Steinach's theories and suggestions, Groedel, in Frankfort, reported very good results. He believes that a stimulation dose for the endocrine portion of the ovary corresponds to the castration dose of the follicular apparatus. Thaler, in Vienna, likewise successfully used stimulation doses for the ovaries in cases of young girls with menstrual disturbances and amenorrhea in order to overcome their hypogonadism.

Only the first six of my cases date back far enough that I feel justified in reporting them, and I shall give you, very briefly, their clinical histories and the results that were obtained.

Regarding technic and the somewhat problematical and much discussed stimulation dose, this much can be said, that a stimulation dose of the ovary is considered by many röntgenologists about one seventh to one tenth of the socalled erythema dose.

In another series of fifteen cases, the patients were treated somewhat differently as to details. I do not feel justified in reporting their clinical histories as yet, since they are of too recent date.

CASE HISTORIES.

CASE I.—The patient, an educator, sixty-four years old, for several years had complained of an increasing lack of mental activity; power of concentration was waning, also imaginative ability. Mental sterility would perhaps best sum up her chief complaints. Outside of occasional sleeplessness requiring veronal, there was no physical disability or physical complaint. She began to menstruate at fourteen years of age, had practically always been regular, except during acute illnesses. The menopause had occurred seventeen years ago. Examination was negative as to any pathological conditions; her pulse was 50; blood pressure 146 systolic, 100 diastolic; skin reaction was almost lacking; weight, 156 pounds.

Treatment was begun in February, 1922, applying a stimulation dose to the right ovary alone. Three more treatments were given at intervals of one week, exposing right and left ovaries alternately. The patient felt very dull and tired for a few days after each treatment. About six weeks after the first treatment, this very intelligent patient, not hysterical at all, stated that she slept better than in many years; that she felt her brain clearer; that she had begun to do considerably more work, and that she felt more "sustained" in it. New ideas had come to her "like a flash," as rarely before. Examination showed a slight increase in weight; pulse 76, blood pressure 130 systolic, 85 diastolic. Skin reaction was red with faintly white borders. During the following months the patient was unusually active, working intensely from ten to twelve hours each day—a strain which she had not been able to endure in many years. She stated that she had regained her power of concentration and that her memory was distinctly better. In June, the patient received another treatment, a stimulation dose to the right ovary; the same, two weeks later, to the left. She was examined again in August, about five months after the completion of the first series of treatments. She felt very well and her friends had remarked upon her healthy appearance. Her weight was the same; blood pressure, 125, 85. She said she had distinctly more endurance, adding that "nothing could tire her any more." In March, 1923, a year after the treatment, her condition was unchanged and satisfactory in every way.

Case II.—This case is less characteristic because the patient, a widow of forty, in charge of a large dressmaking establishment in the West, was compelled to leave New York after she had received only one treatment, in April 1922, consisting of a stimulation dose to the left ovary only. The patient complained of a continuous feeling of exhaustion, being compelled to work hard and under a great nervous strain. She always felt tired and required about ten hours sleep daily. For several years her memory was rather poor and her hair had been turning grey during the past six months. She felt physically unable to perform the task which she had set for herself. Menses began at thirteen, had always been normal and were still regular, and of three days' duration. Examination did not reveal any special ailment. She gave an impression of being very nervous; reflexes were greatly exaggerated; pulse 82; blood pressure, 120-80; weight, 122½ pounds. There was pronounced tremor of the eyelids. In August, about four months after the treatment, the patient wrote that the reactions from the treatment had been very gratifying for a while. Several weeks after taking it she began to feel unusually well, but it lasted only a short time. The improvement, during which she felt "wonderfully well and strong," persisted for about a month, and then began gradually to wane. At the end of August she felt almost as tired as before the treatment. Weight was increased three pounds; pulse was 68; blood pressure, 110-75. Her reflexes had not changed. Her menstruation was not affected. Whether a proper administration of the method by giving several treatments would have produced a more lasting effect seems probable. It is, however, an open question.

Case III.—The patient was a teacher, aged fifty. She complained of stiffness in the limbs, pain in the back, great exhaustion, weakened memory, and great mental depression.

Her menses began at twelve and a half, had never been quite regular; menopause occurred seven months ago. The examination revealed a distinct soft swelling of the thyroid which she said she had had for many years. The heart was moderately dilated on both sides; pulse, 72; blood pressure, 115, 70. Skin reaction showed a distinctly white adrenal line; weight, 148 pounds. On July 22, 1922, one x ray treatment was given, applying a stimulation dose to each ovary. During the night after the treatment the patient had severe palpitation of the heart, which she said she had had only once before, when taking thyroid extract. A few days later she felt very well. The backache had disappeared and she said that she could walk without any discomfort —the first time in several months. She had a distinct feeling of physical strength and energy. Her skin reaction was faintly red; her pulse, 64. She was examined again on August 29th, about six weeks after the treatment. Her socalled rheumatic pains had entirely disappeared; she had occasional palpitation of the heart; was decidedly less tired in spite of being greatly overworked; the thyroid swelling was distinctly reduced. She looked unusually well, so much so that her friends remarked the favorable change in her appearance.

Some change in the endocrine functions (especially thyroid) seemed to have occurred, although, in this case, a certain probability exists that some of these changes were due to autosuggestion.

Case IV.—The patient was a widow, aged fifty-two. Her menopause had occurred four years ago, and since then she had suffered from rather frequent hot flushes, and had been told that her blood pressure was too high. Otherwise there were no complaints. Examination is generally negative, except a rapid pulse, 100 to 110, and a blood pressure of 190 systolic, 110 diastolic. Skin reaction only faintly red. During February and March the patient had had four treatments, receiving stimulation doses alternately to right and left ovary.

Upon reexamination in August, about five months after completion of the treatment, the patient said she felt brighter and more energetic. The hot flushes were still present, but decidedly less frequent. By dieting she had reduced her weight from 164 to 154 pounds. Her pulse was 76; blood pressure, 165 systolic, 100 diastolic. Skin reaction was distinctly red. Another examination only about a week ago, showed the same objective changes. She said that she felt better than in years, and more fit to do her work, especially in the last few weeks. The hot flushes were only rare.

In this case the possibility of an endocrine influence is present. Definite evidence, however, is lacking, since the patient, together with the treatment, underwent a change in her diet in order to reduce weight.

Case V.—The patient was a professional dancer, forty-eight years of age. She had had a nervous breakdown five years ago and had not entirely recovered since. She became tired too easily, lacked the necessary energy, and was very anxious to regain her full strength for her work. She had no other physical complaints. The examination was negative: blood pressure, 140 systolic, 100 diastolic; pulse, 72; skin reaction, red, quickly disappearing; weight, 135 pounds. The patient was still menstruating. During the months of March and April, 1923, five mild stimulation doses were administered, right and left alternately, and after the fourth treatment the patient expected her menstruation which, however, did not appear. She felt very well. Her pulse was 76; blood pressure, 130 systolic, 90 diastolic. She believed herself to be less nervously fatigued. The next month when her menses were due, they appeared in time and were not changed in character. She had noticed a distinct increased firmness in her breasts; felt unusually well; pulse and blood pressure were about the same; weight had increased two pounds. She looked exceedingly well, so much so that her husband said she looked as she did twenty years ago. He was so impressed by the change in her appearance that he himself, a man of sixty-one, decided to have the Steinach operation performed.

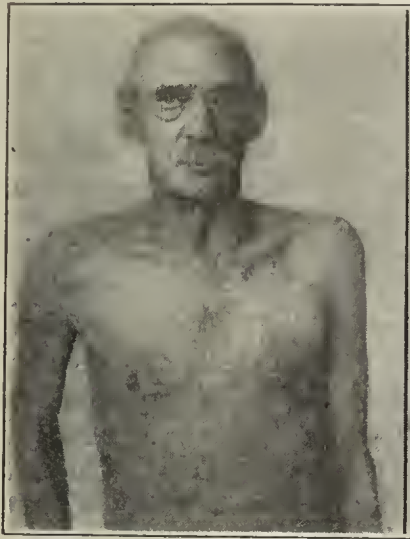

Fig. 1.

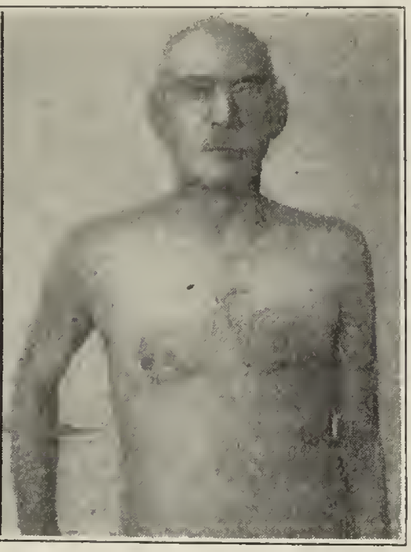

Fig. 2.

Fig. 1.—A merchant of sixty-eight years as he appeared before the operation, which was performed on October 4, 1920.

Fig. 2.—Shows the same patient two months after the operation.

Case VI.—A singer, aged forty-seven, complained of extreme nervousness, lack of ambition, waning memory and general mental fatigue. Her menopause had occurred seven years ago. Since then she noticed a general decline, especially in her voice. Twenty-two years ago the patient had part of her left ovary removed on account of a cyst. Examination was negative except for an increase in blood pressure which was 170 systolic, 90 diastolic; pulse, 72. Skin reaction faintly red.

Four treatments were given in April, treating both sides simultaneously with a stimulation dose. In August, about four months after the treatment was completed, patient said that she felt more balanced in her nerves, less emotional, but could not say much about her voice since she felt no desire to sing. She still complained of a lack of courage. Examination showed a certain decrease in blood pressure, 145 systolic, 96 diastolic, pulse, the same. Skin reaction distinctly red. Her weight had not changed.

In this case, too, an endocrine influence is very possible, although by no means proves, since the patient showed distinct mental inhibitions and the whole case apparently contained a strong psychic element. I advised that psychoanalysis should be used in addition.

In drawing conclusions from these six cases, I would advise great conservatism in their interpretation.

It is doubtlessly true that x rays change the histological structures and functions of the ovaries. It is also true that animals, after x ray exposures of their ovaries to the röntgen rays. Therefore, the development of their sex characters and, as far as women are concerned, it is true that castration symptoms can be produced by prolonged exposures of their ovaries to the Röntgen rays. Therefore, the probability seems very strong that x ray radiation is able to produce clinical changes in the sense of a regeneration and stimulation of endocrine functions. But after observing these six cases and considering the mentality of the patients undergoing a socalled rejuvenation treatment, I would recommend that one disregard whatever these patients tell or write of their subjective feelings, until more clinical experience is at hand; disregard their statements at least where no objective changes exist to corroborate them. Certain objective changes I have also reported and they should not be treated too lightly, inasmuch as an influence on the endocrine system working in this direction seems highly probable. But in order to feel certain about it, much more clinical material should be observed and over a much longer period. It is needless to say that the method is entirely harmless in the hands of a conscientious expert.

My reason for giving this preliminary report is merely to stimulate interest in "Steinachism" and to encourage further observations and tests along the lines which I have described in accordance with Steinach's theories and suggestions. A more detailed report of the technic and of my experiences will be presented in the future.

On the evening when this paper was read at the New York Academy of Medicine, four reels of a motion picture were shown, under the auspices of the German Medical Society.

These four reels constituted the main part of the socalled Steinach film, which was produced under Steinach's personal supervision by the scientific department of the Universum Film Corporation, Germany. This film depicts and explains Steinach's fundamental experiments and theories and shows the result of the Steinach operation on animals and human beings, and has as collaborators, men like Paul Kammerer, of Vienna, Peter Schmidt, Kurt Thomalla, of Berlin, and others.

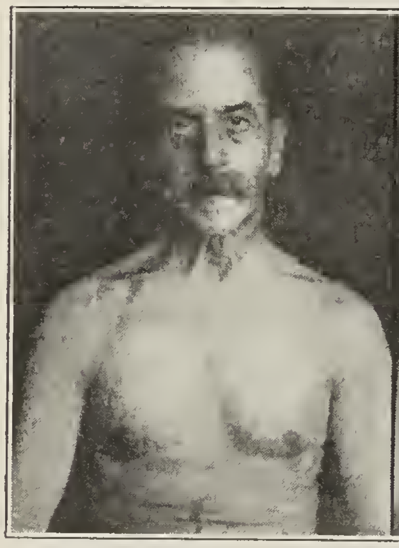

Fig. 3.

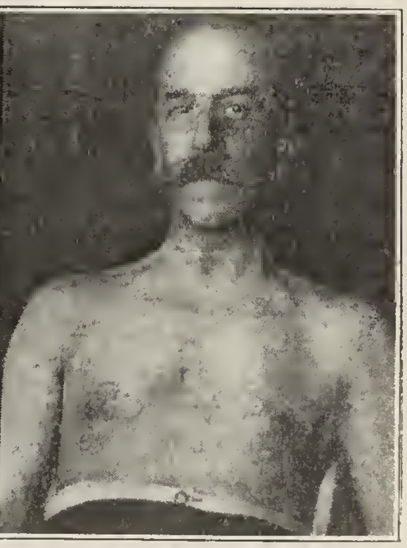

Fig. 4.

Fig. 3.—A controller of fifty-six years of age, who had the operation performed on October 5, 1920, "on account of premature symptoms of age, especially arteriosclerosis causing oppressions, pains and disturbances in gait. The patient was completely disabled and had been pensioned."

Fig. 4.—Shows the appearance of this patient four months after the operation. In the film it is explained that "he is again able to completely perform his duties and again actively in charge of his office." He is shown climbing mountains after he had been unable to walk before the operation.

The pictures reproduced here are two of those patients shown in the film who have, according to the explanation in the film, given "their explicit consent to demonstrate before the public pictorially the changes in their condition, and thus testify to the lasting effect of the operation."

Touching for the King's Evil*

By WILLIAM RENWICK RIDDELL, LL.D., F.R. Hist. Soc., etc.

Toronto, Ontario,

(Concluded from page 667)

The words of the eighteenth verse are repeated by the chaplain after every healing, till all the sick are touched, which being finished, the Gospel is continued to the end of the chapter. The second Gospel is then begun, taken from the first chapter of St. John, at the first verse. After the eighth verse, the surgeons, making three obeisances as formerly, come up the second time with the sick people; the Clerk of the Closet then on his knees delivers to the king the gold strung on a silk ribbon, and the king puts it about their necks, as the chaplain reads the ninth verse, "That was the true light, which lighteneth every man which cometh into the world," which he repeats as each receives the gold. The Gospel is then continued, ending with the fourteenth verse. The Gospel ended, the chaplain, with the rest of the people on their knees, pronounces these prayers:

> "Lord, have mercy upon us.
> Christ, have mercy upon us,
> Lord, have mercy upon us."

These are followed by the Lord's Prayer, and after it these versicles, the responses being made by those that come to be healed:

> Versicle, "O Lord, save Thy servants,"
> Response, "Which put their trust in Thee.
>
> "Send help unto them from above;
> And evermore mightily defend them.
>
> Help us, O God our Saviour;
>
> And for the glory of Thy Name deliver us; be merciful to us sinners for Thy Name's sake.
>
> "O Lord, hear our prayers;
> And let our cry come unto Thee."

Then the chaplain reads this prayer: "O Almighty God, who art the giver of all health, and the aid of them that seek to thee for succour, we call upon Thee for thy help and goodness, mercifully to be showed to these Thy servants that they being healed of their infirmities, may give thanks to Thee in thy Holy Church, through Jesus Christ our Lord. Amen."—and concludes with the Gratia Domini.

The ceremony over, the Lord Chamberlain and two other nobles, having brought up linen, with a basin and ewer to wash the king's hands, he takes leave of the people, "and they joyfully and thankfully do every one return home, praising God and their good king."

If there was any change made by James II, it was immaterial.

The numbers attending the Healings in these two reigns were almost incredible. Charles alone is said to have touched a hundred thousand persons. The records show that between 1668 and 1685 the number of touch pieces or medals was 78,662, and their value £34,942 4s. 2½d.; and an official record of those actually touched shows 90,798. It seems certain that the numbers presenting themselves for healing varied according to the popularity of the king for the time being; activity was promoted also by propaganda—"In less than eleven months of James's reign and for a period during which the Catholic movement fostered by himself was in full progress, no less than 14,364 persons are stated to have sought miraculous relief at his hands five times more favorable than his adored brother could ever boast of"—and a respectable authority says that James touched more than 6,000. But James was ever of frugal mind; he reduced the average value of the medals from ten shillings, as it had been in the time of Charles, to five shillings, and thus provided "for the requirements of a fictitious popularity without having recourse to an increased expenditure" (72). It was during the reign of James II that the tragedy occurred which is recorded by Evelyn in his diary under date February 28, 1684: "There was so great a concourse of people with their children to be touched for the evil that six or seven were crushed to death by pressing at the chirurgeon's door for tickets" (73).

The Revolution of 1688 placed King William III on the throne; he was asked to touch, but declined, referring the supplicants to the Stuart at St. Germain (74).

But if he declined, another but less fortunate claimant of the crown, did not. The Duke of Monmouth, natural son of Charles II, who led the rebellion in the West against his uncle, attempted to establish his legitimacy by touching. In the proceedings before the Court of Judiciary, Edinburgh, against the Duke of Buccleuch (Monmouth's father in law) and others for high treason (1685, 1686), "the criminall letters raisit at the instance of Sir George M'Kenzie of Rosehaugh our soveraigne lord's advocat" charged that on Monmouth taking "upon him to be a King . . . he commanded as King . . . and touched off the King's Evil and did exercise the other functions off royall dignitie" and "Captaine Anthony Buyse, latlie captaine in the duke of Brandenburgh's service aged threttie years or therby" did solemnly "depon" that he "saw him tutch for a disease which he understands since they call the King's evill" (75).

Queen Anne succeeded William of Orange; she was a Stuart and had no qualms about her gift of healing. She began to touch shortly after her accession in 1702, and continued the practice until the last year of her reign, 1714. The last occasion of which I have seen any record was within three months of her death. The newspapers of the day say that on March 30, 1714, Queen Anne touched two hundred persons; and among these it is known was Samuel Johnson, then about four and a half years old (76).

Anne was the first sovereign to have the Office of Healing inserted in the Book of Common Prayer. While it has been stated that it appears in a Prayer

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*Read before the Toronto Academy of Medicine.

Book of 1703 folio, the first that is extant containing it is of date 1706. The latest in English is 1732 but a Latin version is found as late as 1759 (77).

Queen Anne's form differed a little from that used before her time; first a prayer, then the Gospel, Mark xvi, 14-20; then the Kyrie; then follows the Lord's Prayer, then the patients one by one presented to the queen upon their knees and as every one is presented and while the queen is laying her hands upon them and putting the gold about their necks the chaplain that officiates turning himself to Her Majesty, says these words, "God give a blessing to this work and grant that these sick persons on whom the queen lays her hands may recover through Jesus Christ our Lord"; then a further responsive prayer, a collect, and an address by the chaplain to the sick followed by the benediction, all in English (78).

On Queen Anne's death in 1714, George of Hanover succeeded; though the Office continued to be printed in the Prayer Book for some years (79) with simple changes from "the Queen" to "the King," etc., the ceremony never was again performed by a sovereign.

But while the abnegations of William III. and of the Georges were in full force the gift was not in abeyance nor did Queen Anne have a monopoly. James II. touched at St. Germain, as did his son the Old Pretender after him. The Young Pretender, Charles Edward, also touched at Edinburgh during his occupation of that city in the rising of '45. The Cardinal of York, who assumed the title Henry IX., on the death in 1788 of his brother, also claimed the gift and he is said to have exercised it (80).

The first royal bounty specifically allotted to the touched was almost certainly the angel or angel noble first coined in 1465 by Edward I.; this continued to be coined until the times of Charles I. The coin copied the device of the French gold coin *angelot* or *ange,* first struck by Louis XI—the Archangel Michael standing upon and piercing the Dragon; on the reverse was a ship on the waves with sails set. The coins differed in size and value from time to time and the inscriptions also changed. On the restoration, the angel being no longer coined, medals called "touch pieces" of less value were substituted; these were pierced to allow of a white ribbon being inserted whereby the king might hang them on the neck of the patients.

The touch pieces of Charles II. were of gold; James II. had also gold pieces but smaller and less valuable; he also had silver pieces, and so far as known the Pretenders and York also employed silver. Queen Anne used only gold.

These medals differed slightly in minutiæ, from time to time the device of Michael standing upon and transfixing the Dragon and the device *Soli Deo Gloria.* The reverse had the ship on the waters with sails set, also differing in minutiæ. The ship is in full sail in those of Charles II., James II. and Anne; the Old Pretender James III., the Young Pretender, Charles Edward, and Henry IX. have the ship taken aback, perhaps symbolical of their unhappy estate. In one of the pieces of the exiled Stuarts the device is the rose, thistle and shamrock, on the reverse is a representative of a hand from heaven coming down upon four heads and the words "He touched them," the motto being completed on the other side "and they were healed."

Of the efficacy of the royal touch there is overwhelming evidence, and it is proved as far as such a matter can be proved. The number running into the hundreds of thousands touched alone indicates some success, but this may be in part due to the gold or silver received; and in any case is not satisfactory evidence. Nor can we place much reliance upon the certificates of churchmen of high or low degree, such as Archbishop Bradwardine of the time of Edward III., Dean Tucker of Queen Elizabeth, Archbishop Sancroft of Charles II., Bishop Bull, Bishop Douglas, quoted by Hussey. They are largely influenced by a priori considerations. But men of the highest standing in the medical profession, from John of Gadsden down, are witnesses who cannot be contemned.

John of Gadsden, the father of English medicine, in the reign of Edward II. advised recourse to the touch in desperate cases, as the kings had the power of curing it (81). John is sometimes unkindly called a quack but he was the first Englishman employed as a physician at court, being appointed Royal Physician-in-Ordinary, by Edward II.; and he was quite abreast of the existing medical science. I pass over the certificate of Sir John Fortescue, Chief Justice in the times of Henry VI. (82), and come to another physician, Andrew Borde in the reign of Henry VIII., a physician of eminence, educated at Oxford, a graduate of Montpellier in medicine (83), who says: "For this matter, let every man make friendes to the Kynges Majestie, for it doth perteyne to a Kynge to helpe this infirmitie, by the grace of God, the which is geven to a king anoynted. But forasmuch as some men doth judge divers times a fystle or a French pocke to be the king's evil, in such matters it behoveth not a kynge to medle withall."

William Clowes (the elder), in the time of Queen Elizabeth, surgeon of St. Bartholomew's and Christ's Hospitals, a practitioner of the highest standing, says that this disease was "miraculously healed by the sacred hands of the Queen's most royal majesty, even by divine inspiration and wonderfull worke and power of God above man's skill arte and expectation" (84). And he gives a very remarkable instance of the cure by royal touch of a German who had been thirteen months his patient (85). Richard Wiseman, serjeant-surgeon to Charles I., surgeon-in-ordinary to Prince Charles, and subsequently on the Restoration appointed surgeon in ordinary for the person of the king, Master of the Barber-Surgeon's Company (corresponding to the present Royal College of Surgeons), gives the evidence of an eyewitness: "I myself have been a frequent eyewitness of many hundreds of cures performed by His Majesty's touch alone without any aid of chirurgery . . . from the several parts of the nation . . . also from Ireland, Scotland, Jersey and Guernsey . . . the weakness of our ability when compared with his Majesty's who cureth more in any one year than all the chirurgeons of London have done in an age" (86).

John Browne, already mentioned, surgeon in ordinary to Charles II., went into the matter very fully both historically and practically; he describes many wonderful cures about which he has not the slightest doubt (87).

The much more celebrated physician, Sir Thomas Browne, of Norwich, does not in his well known *Pseudodoxia Epidemica* make mention of healing by the royal touch but from what is said by John Browne, it would appear that he believed in it (88). A little later there can be no kind of doubt as to the belief of Dr. Daniel Turner. He relates several cures by Queen Anne after he and his coadjutor, Charles Bernard, serjeant-surgeon to the Queen had failed, and adds: "It is the misfortune of some to miss of their cures after much pain and great expense, yet it hath been the good luck of others to obtain one in this particular disease . . . I mean by the royal touch" (89).

Perhaps the most satisfactory, as it is the most extensive, account is given by William Beckett, F.R.S., surgeon and antiquary, surgeon to St. Thomas' Hospital and an author of repute. Far from being a credulous man, he was skeptical of the actuality of the cures; but he was convinced by the citations from the records furnished him by the elder John Austin, Garter King at Arms, and his own investigations of the antiquity of the practice. He is not convinced that it was the touch which healed but he considers it impossible to prove the cures supernatural or miraculous (90).

The evidence of the efficacy of the touch of the French kings is equally conclusive, but it is quite too long to set it out in this place.

There were always sceptics. Let me give an example or two. Samuel Pepys in his *Diary* under date of November 2, 1660, says: "By chance Mr. Holliard called at dinner time and dined with me, with whom I had great discourse concerning the cure of the King's Evil which he did deny altogether any effect at all" (91). Pepys' own opinion will appear from his entry for 1661, April 13 (day before Easter) "So to Whitehall again and met with my Lord above with the Duke; and after a little talk with him I went to the Banquet house and there saw the king heal, the first time that I ever saw him do it; which he did with great gravity and it seemed to me to be an ugly office and a simple one" (92).

Nor were the sovereigns the only successful practitioners of this method. Mention may be made of John Leverett; he was a gardener who took it upon himself to cure the King's Evil and he touched many. William Clowes (the younger), sergeant surgeon to King Charles I., and Master of the Barber Surgeons Company, brought him before the Star Chamber, October 20, 1637, and was directed by the lords in that court to lay the matter before the College of Physicians. Leverett appeared before the College, November 3, 1637, and stated that he had cured by touch alone King's Evil, dropsy, fever, agues, internal diseases and external sores, and said he was a seventh son. On inquiry made it turned out that he was a fourth and not a seventh son. Thomas Clowes and two other surgeons of London certified that his cures were impostures, and it appeared that he "enticed great lords and ladies to buy the sheets he had slept in and deluded the sick with false hopes." Leverett was stopped, but I think he did effect cures (93).

Shortly before Leverett's time, one James Phillip Gaudre, Knight of St. Lazare in France, prisoner for debt in the King's Bench Prison in London, took upon him to touch for the King's Evil; he was examined by Sir Thomas Richardson, Chief Justice, and alleged that he had cured many poor persons of the King's Evil, and some after being touched by His Majesty; he had used his skill in France before coming to England; he was the youngest of seven sons. The Chief Justice acquitted him of sorcery and fraud but reported that he was in contempt for taking upon himself a royal function (94).

The well known case of Valentine Greatrakes and his cures by touch will occur to everyone, "A gentleman, a member of the Church of England, of great honesty and exemplary sobriety, who is said to have refused any gratuity for his services," he performed marvelous cures of the King's Evil and afterwards of ague, epilepsy, convulsions, palsy, deafness and other complaints, all indeed "peculiarly under the influence of the nervous system." This was in the reign of Charles II. (95).

A still more recent case not wholly unlike the touch, is Perkins' Tractors, the story of which is familiar to everyone. There is not the slightest reason to doubt the good faith of Perkins or his patients. Dr. Elisha Perkins, of Norwich, Connecticut, thought he had discovered a new healing instrument in two rods, one of steel and the other of brass. The affected part of the body was stroked with the rods; and many cases of remarkable cures of rheumatism and of some of the neuroses were reported. Many medical men certified to the efficacy of this treatment and it became very popular in England. Dr. John Haygarth found by experiment in the Bath Hospital that rods of wood were quite as effective if the patients were not undeceived; and though a "Perkinson Institute" was established in London the practice gradually dwindled to complete disappearance. But it was successful while it lasted and was believed in (96).

There can, in this age of the world, be no difficulty in arriving at the truth. First, let us see what scrofula is.

Until but the other day it was considered a specific disease distinct from all others (97); it is now, of course, recognized as a form of tuberculosis. In many cases, the patients need but to be let alone to cure themselves; in most cases, cures are accelerated by change of scene, expectation, imagination, hope—all cases of cure were of this character.

And the touch was by no means always successful. Dr. Johnson suffered all his life from one form or another of the disease, and Hussey in text and manuscript notes gives a certain instance of speedy mortality of which there must have been thousands. In the Parish Register of Stanton St. Johns' near Oxford is an entry, 1705, March 25, "I gave a certyficate concerning Ralph Gilbert's son, Ralph, not being formerly Touch'd for ye King's Evil"—then there is a burial entry June 13, 1705, of "Ralph ye son of Ralph Gilbert day labourer and Elizabeth his Wife"—he was about twenty years old. (In the same registers we have Thomas, son of Thomas and Amy Grant, receiving a certificate February 25, 1684, and being buried sixty-one years later, March 27, 1745, aged seventy-three years).

The power of the imagination is almost unlimited. For example, among the Athenians many a man died of drinking bull's blood, the idea of the poisonous quality of which has not the slightest physiological foundation (98). So the effects of certain alleged medicines; and I instance the famous Mithridaticum which was a sovereign antidote against all poisons; it was discovered by Mithridates, King of Pontus, and with it he successfully defied all attempts to poison him. The prescription was found among his papers by Cn. Pompei and is given by Pliny: "Take two dry walnuts, two figs, twenty dried leaves of rue, add a little salt, take on an empty stomach. On the day this dose has been administered no poison can take effect." This was fully believed in until the end of the Middle Ages.

It is worth while to quote the opinion of the wise old Richard Mead, Colleg. Medicor. Lond, at Edinburg, Soc. Reg. Societat. Sodal, et Medicus Regius; he in his *Monita et præcepta Medica,* published in London, 1751, a book which it is a delight for all to read who have not forgotten their Latin, says:

"Yet there is in this disease, however nonresponsive to treatment it may be, the notable characteristic, that often by reason of change in age or habit of the body—especially in youth—it spontaneously comes to an end so that the original health is restored. It was this fact, in my opinion, which first brought into vogue what they call the royal healing touch. For when astute men apprehended this feature of the disease, they easily and naturally came to the conclusion that they would make the kings favorable to the practice if they could persuade them to make experiment of their power with solemn ritual accompanied by prayers of priests, whereby they would be able to gain the reverence of the people toward themselves and if the event were successful, prove that they held the throne by divine right. It is not at all to be wondered at that the statements had full credence given them and that some times the kings themselves believed that they had this power of healing as a gift from heaven for

> Nihil est, quod credere de se
> Non possit, cum laudatur, dis aequa potestas
> Juvenal, Sat. IV, v. 70.

"And the world wishes to be deceived—the event occasionally fell out as wished for, to which result the force of imagination which has very great influence in the curing of disease, contributed not a little. This favor our kings (except when some more enlightened prince happened to occupy the throne) humanely conferred upon their credulous people daily. The kings of France, indeed, boasted that they had this gift from Heaven before ours.

The author's notes will appear in his reprints.

Practical Applications of Basal Metabolism*

By JESSE G. M. BULLOWA, M.D.,

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Before any diagnostic procedure can be introduced into everyday practice with any prospect of permanence, it must meet certain conditions in respect to the procedure and to the information it provides. The procedure must be without pain or distress to the patient, require little time, and not be too costly for general application. These conditions are all met by the simplified Benedict method of determining the oxygen consumed in a definite time and calculating the calories for surface area and age, with the help of tables DuBois developed by means of the elaborate respiration calorimeter.

The patient comes to the office in the morning, fasting, twelve to fourteen hours after an early meal the night before. There, after resting one half to one hour, the test is performed in a quiet room. The test and its control, with calculations, require about one hour. The cost of the material is insignificant. Oxygen and calcium carbonate are consumed. The apparatus is not unduly costly and simple types of apparatus, which is essentially a water sealed spirometer, may be purchased or even improvised from material readily assembled from old gas masks and sheet metal with the aid of a tinsmith. The performance of the test requires some expertness and practice, but less actual manual dexterity and skill are necessary than is expected of every competent physician in physical examination by palpation, percussion, and auscultation. The results must be interpreted with insight into attending circumstances, but then, no medical data can be inserted into an adding machine to furnish the answer.

Basal metabolism determinations replace no other clinical observations, but they do furnish an additional physical sign which is rapidly entering all complete examinations where indicated. For a physical sign to become established it must either give information which is pathognomonic or which is susceptible of precise interpretation in the presence of other phenomena. The fact that the information may sometimes be inferred from other physical evidence does not detract from its value, because it is upon corroboration of various sorts of evidence that we base a diagnosis.

The actual determination of basal metabolism furnishes a quantitative measure of the change it reveals. There are characteristic clinical manifestations of disturbances in the metabolism of fat and phosphorus, revealed by the distribution and accumulation of fat; in the metabolism of lime, by the shape and density of x ray shadows; and in the metabolism of sulphur, by the condition of the skin, hair and nails, as well as in the basal metabolism or the metabolism of oxygen used as an indicator, revealed by disturbances of the pulse rate and tissue turgor. The conditions influencing these metabolic changes are many. Only the basal metabolism is susceptible of ready quantitative and immediate determination at the bedside.

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*Read before the Medical Association of the Greater City of New York, March 19, 1923.

Among the factors governing the changes in the metabolism of these various substances are the hormones produced by the ductless glands. Students of the endocrine organs have collected an enormous mass of painstaking observations. Unfortunately they have also elaborated a system of uncritical inferences from this material so that the literature reads more like fiction than science. On this account an exact quantitative method of observation has quickly established itself as a useful corrective for the tendency to romance.

I wish it had been possible to report that changes in basal metabolism were pathognomonic. Unfortunately this is impossible, but the determination of basal metabolism has been established as a useful clinical guide in a number of conditions. The field in which it has proved most useful is in the diagnosis and treatment of diseases of the thyroid. The active principle of the thyroid—thyroxin—causes a definite increase of metabolic change under basal conditions. This is, however, quite different from the assertion that increases in basal metabolism in thyroid disease are due primarily to excessive thyroid secretion. The experiments of Marine have shown that it may be the unantagonized thyroid secretion which is important. There may be other as yet undiscovered factors.

The determination of basal metabolism is helpful under three circumstances. The basal metabolism may be normal in the presence of symptoms which from their frequent association with hyperthyroidism have themselves been attributed to excess of circulating thyroxin. I refer to symptoms due to overaction of the vagus sympathetic system and its results. The separation of the Graves syndrome as a distinct condition from hyperthyroidism is an important trend in modern medical thought, made possible by the work of DuBois, Kendall and Gudernatsch. Enlargements of the thyroid, or goitre, occur in adolescence, frequently with other symptoms which formerly were considered sufficient to make the diagnosis of incipient exophthalmic goitre. In these cases the basal metabolism is usually normal. They are relieved by the administration of iodine. These goitres should not be removed; the patients need all the thyroid secretion available. Definite goitres may occur with the symptoms of Graves' disease and the basal metabolism may be normal. The symptoms of Graves' disease may occur without the presence of goitre and the diagnosis of an aberrant hypersecreting thyroid may depend upon increased basal metabolism determination. Increase in the basal metabolism is evidence of an excess of available thyroxin, except in conditions which are readily distinguished from it, such as erythremia and leucemia.

The presence of low basal metabolism occurs in pituitary deficiency, in cretins and in myxedema. It is especially important in the diagnosis of the more obscure cases of the last named condition. Patients frequently present themselves suffering from mild Graves' symptoms, a tremor, slight exophthalmos, nervousness and acceleration of the pulse. Sometimes there is a slight goitre. There may or may not be a story of recent accumulation of fat. In the past these patients were regarded as suffering from hyperthyroidism, dysthyroidism, or hyperhypothyroidism. Many of them show a diminished basal metabolism. Such a patient presented herself recently. She suffered from severe headache associated with menstruation. She had been generally regarded as a subjct of hyperthyroidism. She might have been. At present her basal metabolism is twenty-five per cent. below normal.

The simultaneous hyperhypothyroidism conception must yield to definite evidence of thyroid deficiency revealed by the basal metabolism test. There is no evidence, experimental or clinical, to support the view that such a patient is suffering from a change in the thyroxin, as many such patient's have normal basal metabolisms and the symptoms might exist without implication of the thyroid.

Large colloid goitres are frequently associated with normal or subnormal basal metabolism. They should not be removed except when they produce menacing symptoms from pressure. To attempt thyroid surgery without basal metabolism determination seems, at the present day, not only utterly unscientific, but dangerous to the life of the patient and the reputation of the surgeon. It has been shown that the manifestations of hyperthyroidism may be reduced by exposure to the x ray. To destroy thyroid tissue by exposure to x ray without justification from the evidence of basal metabolism tests seems equally culpable.

In the treatment of myxedema, basal metabolism determinations are a measure of efficient doses of thyroxin. For such patients, repeated determinations are as important as any other observation. In the treatment of patients by x ray or by surgical ablation, whether by arterial ligation or by actual removal of the gland, the extent of the procedure should be estimated from the amount of the disturbance in the basal metabolism. The basal metabolism is roughly an evidence of thyroxin overproduction, as well as of surgical resistance. The published charts and my own experience lead me to believe that the return to a normal basal metabolism after thyroidectomy is not rapid, and I have seen almost identical courses in patients thyroidectomized and in those treated by the administration of adrenal cortex. Emphasis should be placed on the importance of not giving to the evidence of basal metabolism any finality in the diagnosis of primary thyroid disease. Increase or deficiency in thyroid function is all it shows and this may be in response to influences arising elsewhere rather than from inherent thyroid disease. Aside from the treatment of thyroid disease, basal metabolism determinations are of value as a measure of the efficiency of x ray treatment in myelogenous leucemia.

Another condition in which basal metabolism determinations have been of service are the nephroses. Epstein and Lande have shown the association of diminished basal metabolism, edema, and a high cholesterinemia. Oskar Frankl deems the cholesterinemia of small importance. Thyroid extract is of value in treating obstinate edemas in this condition and the high nitrogen diet, originally recommended by Widal, may act in them by stimulating the thyroid. Empirically, Eppinger found thyroid useful in this condition. Basal metabolism determinations now offer an additional aid to accurate diagnosis and treatment, and indeed segregate the edemas amenable to thyroid therapy.

In obesity, basal metabolism determinations apparently establish the infrequent association of lowered available thyroxin. Other factors seem to be involved in the increased fat storage which may be preferably counteracted by dietary restriction. When thyroid is fed it should be done only with the control of frequent determination of the basal metabolism. No signal assistance has been furnished by basal metabolism determinations, with oxygen as an index, in diabetes. The respiratory quotient may be calculated, however, and this is of diagnostic importance, especially in conjunction with the use of insulin.

Unquestionably the increased use of basal metabolism apparatus in other conditions will bring to light still further practical applications and no one can foretell the full measure of its usefulness in the exact diagnosis of clinical syndromes and the consequent aid to therapy. I trust that I have shown that basal metabolism determinations are already a necessary feature of everyday clinical practice.

62 West Eighty-seventh Street.

Provision for the Care of Convalescents in New York City*

By THE PUBLIC HEALTH COMMITTEE OF THE N. Y. ACADEMY OF MEDICINE

Provision for the care of convalescents constitutes an indispensable complement to hospital treatment. In New York City the need of institutional convalescent facilities has been acutely felt because of the economic and home conditions of a large portion of the population. Individual philanthropists, as well as organized charity, have responded to the need and established convalescent homes which are maintained and operated independently of the hospitals. Only seven of the sixty-two convalescent institutions are operated by hospitals; two of these are associated with hospitals for children, two with orthopedic hospitals, and three with general hospitals, two of these three belonging to one institution and devoted almost exclusively to work for child patients, the other operated by another general hospital and open during the summer only.

Since the costs of construction and maintenance of convalescent homes are considerably lower than those of hospitals, it has been frequently urged that the hospitals establish country branches to which convalescent patients could be sent to receive proper treatment and supervision until they have been fully restored to health and economic usefulness. Such country branches would not only be advantageous to the patients whose restoration to health, both physical and mental, could proceed under the same general direction as in the hospital where they were treated, but would also make more beds available in the city for cases of acute illness, as the average length of stay of the patient in the hospital would be shortened by transfers to the country branch. Several general hospitals have had the establishment of such homes under consideration. One of the reasons why further action has not been taken is the uncertainty as to whether such a convalescent home, with its patients limited to those of one hospital, could be economically maintained throughout the year; and the second reason is the existence of a large number of convalescent homes with an average utilization of not much more than seventy per cent. of their effective capacity. Furthermore, the whole problem of convalescence has not been attacked in a scientific manner, either in its medical or its community relationships.

CONVALESCENT NEEDS.

The recent war experience has led some observers to the conclusion that "the average patient who has been sufficiently ill to require the average length of stay of three weeks in a hospital for acute diseases, has also been sufficiently ill to require an additional average period of three weeks under observation in a convalescent home or hospital." (1)

Not only hospital patients but others who pass through a period of serious illness require proper environment for their convalescence. Since, however, it would be utterly impractical and prohibitively expensive for the community to provide convalescent facilities for all those recovering from sickness, the patient's home must serve the purpose in the large majority of cases, and social service agencies have a great opportunity to aid the families with whom they come in contact to make this convalescent period in the home as effective and helpful as it can be made by intelligent supervision and guidance. There remains, however, a large number of patients who cannot obtain, under existing housing conditions, the type of care necessary for proper recovery. It has been estimated that for convalescent purposes the community should provide facilities equivalent to twelve per cent to fifteen per cent of its total hospital bed capacity. (2) On this basis, New York City with its 32,000 hospital beds (including private rooms in hospitals as well as proprietary institutions) would require from 3,840 to 4,800 beds in institutions for convalescents. Another estimate places the need at twelve per cent of all hospital patients, allowing ten per cent. for the hospital patients proper and two per cent. of this number for other patients. In New York City we have in round numbers 375,000 hospital patients annually; according to this estimate, 45,000 persons require institutional convalescence. The average stay of a convalescent patient is twenty-one days; each bed can, therefore, be used by seventeen patients in a year. On this basis, the total number of beds needed would not exceed 2,650. The various estimates undoubtedly have a sound pragmatic basis but cannot be more than suggestive of a norm, as the actual demand for facilities depends upon many variable conditions, such as the economic cycle of industrial prosperity and depression, housing conditions, the interest of hospital authorities in their patients, the activities of the social service departments, the prevalence of illness and other factors. The fact that the large majority of hospital patients are surgical cases, many requiring facilities which are nonexistent in the usual type of convalescent institution, is a factor which has not been seriously considered as yet in the staffing and equipping of convalescent homes. It should also be borne in mind that the convalescent homes, situated as they are outside the city limits, serve the outlying communities as well, and to that extent the facilities for the sick residents of the city are curtailed. A study of the domiciliary distribution of the patients indicated that in some of the institutions the proportion of those residing outside of New York City limits is considerable; in one instance, it was as high as sixteen per cent. of the total during a particular year.

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*This paper was prepared by Edward H. Lewinski-Corwin, Executive Secretary of the Public Health Committee, and constitutes one of the sections of the study of hospitals made by the committee. The membership of the committee is as follows: Charles L. Dana, M. D., chairman; James Alexander Miller, M. D., secretary; Nathan E. Brill, M. D.; Samuel A. Brown, M. D.; Robert J. Carlisle, M. D., James B. Clemens, M. D.; Leland E. Cofer, M. D.; Rufus I. Cole, M. D.; Robert L. Dickinson, M. D.; Haven Emerson, M. D.; Lewis Fox Frissell, M. D.; S. S. Goldwater, M. D.; Royal S. Haynes, M. D.; John A. Hartwell, M. D.; Ward A. Holden, M. D.; L. Emmett Holt, M. D.; Walter B. James, M. D.; Charles E. Nammack, M. D.; Walter L. Niles, M. D.; Bernard Sachs, M. D.; Thomas W. Salmon, M. D.; Charles Hendee Smith, M. D.; Frederic E. Sondern, M. D.; M. Allen Starr, M. D.; Howard C. Taylor, M. D.; W. Gilman Thompson, M. D.; Philip Van Ingen, M. D.; Karl M. Vogel, M. D.; George B. Wallace, M. D.; Cassius H. Watson, M. D.; Herbert B. Wilcox, M. D.; Linsly R. Williams, M. D.

AVAILABLE FACILITIES.

It is sometimes difficult to draw the line between a convalescent home and a socalled fresh air home, as in many instances, the latter only take applicants who are below par in health, but who are not convalescent in the strict sense of the word. The line has been drawn as far as is possible, and the number of beds in institutions in or around New York City which are regarded as serving distinctly convalescent patients is 3,220. Of this number of available beds, 1,189 are for adults and 2,031 for children under sixteen. These figures of course are subject to correction at any time. Of the 1,189 beds reserved for adults, 339 or 28.5 per cent. are for men and 850 or 71.5 per cent. for women. The division of beds for children is approximately as follows: 566 for babies, 681 for boys and 784 for girls. Of the total number of beds available for adults, 559 are in institutions exclusively for adults and the remainder in institutions which take both adults and children. 1,314 beds out of a total of 2,031 for children are in institutions maintained exclusively for children. Of the total sixty-two institutions, forty-five are operated all the year round, thirteen only during the summer months, and four only during the winter. The seventeen part time institutions have a combined bed capacity of 857 beds, which on the basis of a four months' utilization in a year is equivalent to 286 available the year round. Our total convalescent bed capacity on the annual available basis does not exceed 2,650. With the exception of certain institutions for the care of children which admit only certain types of conditions, the convalescent homes do not specialize in any particular type of patients, except that many of them exclude mental and neurological cases, orthopedic patients unable to care for themselves, nontuberculous pulmonary cases with a disturbing cough and those requiring special diets or surgical dressings; in many institutions neither negroes nor adolescent boys are taken, the former because of race prejudice and the latter because of their unmanageability.

Aside from tuberculosis sanatoria which are not included in the group of institutions under consideration here, the greatest progress has been made in provision for sufferers from cardiac diseases, although the need in this connection has not been fully met. The need for convalescent care of orthopedic cases has been forcibly brought before the community, and provisions have been made to meet the demand to a certain extent. In some instances, it is difficult to draw the line between a convalescent and a chronic patient, and as the needs of the latter are entirely different from that of the convalescent patient, they are not discussed here.

Most of the convalescent homes do not publish statistics of conditions from which the patients convalesce and some of them do not even keep such statistics. It is, therefore, impossible to ascertain the extent to which certain types of cases are more adequately provided for than others.

An inquiry of the social service departments of the hospitals was made with a view of eliciting information as to the types of patients who are most difficult to place in convalescent homes. The replies received do not focus on any particular condition. The most frequently mentioned difficulties are encountered in placing neurological and mild psychosis cases, special diet cases such as nephritics and diabetics, and postoperative, gastric ulcer cases, adolescent boys, helpless and crippled children, mothers with children, and certain types of older men.

The following is a list of convalescent homes serving New York City with their bed capacities.

CONVALESCENT FACILITIES FOR GREATER NEW YORK—1922-1923

1.	Babies' Hospital, Summer Branch, Rumson, N. J.	55
2.	Bikur Cholim Convalescent Home, Mt. Vernon, N. Y.	25
3.	Blythedale Home for Convalescent Children,[1] Hawthorne, N. Y.	40
4.	Burke Foundation, White Plains, N. Y.	300
5.	Campbell Cottages (New York Hospital),[2] White Plains, N. Y.	80
6.	Caroline Rest (A. I. C. P.),[3] Hartsdale, N. Y.	114-120
7.	Children's Country Home (Assn.),[4] Westfield, N. J.	18
8.	Convalescent Home for Hebrew Children,[5] Rockaway Park, L. I.	Avg. 78
	Aftercare Home for Crippled Children,[5] Rockaway Park, L. I.	30
9.	Country Home for Convalescent Babies, Seacliff, L. I.	50
10.	Daisy Fields Home and Hospital, Englewood, N. J.	18
11.	Edgewater Creche, Englewood, N. J.	20
12.	Elizabeth Milbank Anderson House (C. A. S.), Chappaqua, N. Y.	175

13.	Gallatin Cottage (C. A. S.), Valhalla, N. Y. (See note on Kinderfold.)	50
14.	Gerald Ease, White Plains, N. Y.	15
15.	German Home for Women and Children, Coney Island, N. Y.	45
16.	Gould Farm,[6] Great Barrington, Mass.	12.5
17.	Greenview House, Bradley, N. Y.	14
18.	Health Home (C. A. S.),[7] Bath Beath, L. I.	230
19.	Hebrew Convalescent Home, New York, N. Y.	45
20.	Hill Top Camp (Presbyterian Hospital),[8] Hawthorne, N. Y.	32
21.	Holiday Farm, Rhinebeck, N. Y.	50
22.	House-by-the-Sea (Union Settlement), East Moriches, L. I.	25
23.	House of St. Giles the Cripple,[9] Garden City, L. I.	60
24.	Incarnation Winter Home, Lake Mohegan, N. Y.	28
25.	Isabella Home,[10] New York, N. Y.	56
26.	Jane Elkus Home (Free Synagogue), Oakhurst, N. J.	22
27.	Jewish Home for Convalescents,[11] Grandview, N. Y.	40
28.	Josephine Home, Peekskill, N. Y.	25
29.	Kinderfold (C. A. S.),[12] New Brighton, S. I. Goodhue Home, New Brighton, S. I.	10 3
30.	Loretto Rest (Catholic Charities), Cold Spring, N. Y.	16
31.	Lulu Thorley Lyons Home, New York, N. Y.	50
32.	(Bishop) McDonnell Hall for Convalescent Women, Commack, L. I.	24
33.	Maple Cottage, Peapack, N. J.	24
34.	Martha Summer Home, Ossining, N. Y. (See note on Kinderfold.)	6
35.	Martine Farm, White Plains, N. Y.	24
36.	Mary Zinn Home for Convalescent Cardiac Children, White Plains, N. Y.	41
37.	Mineola Home for Cardiac Children,[13] Mineola, L. I.	56
38.	Montclair Fresh Air and Convalescent Home, Verona, N. J.	36
39.	Moore (James A.) Memorial Home,[14] Seabright, N. J.	10
40.	Mountain Pass Farm (Friendly Aid Society), Hillsdale, N. Y.	36
41.	Neustadter Home, Yonkers, N. Y.	58
42.	New York Orthopedic Hospital, Country Branch,[15] White Plains, N. Y.	135
42a	Noyes Memorial Home (St. Mary's Hospital)[16] Poughkeepsie, N. Y.	30
43.	Pelham Home for Children, Pelham Manor.	
44.	Reed Farm, Valley Cottage, N. Y.	33
45.	Nichols Cottage, Valley Cottage, N. Y.	6
46.	Rest for Convalescents, White Plains, N. Y.	72
47.	St. Andrew's Convalescent Hospital,[17] New York, N. Y. St. Andrew's Rest, Woodcliff Lake, N. J.	average 26
48.	St. Eleanora's Home and Cottage for Convalescents, Tuckahoe, N. Y.	55
49.	St. James Convalescent Home, Norwalk, Conn.	20
50.	St. John's Home (Catholic Charities), Mamaroneck, N. Y.	25
51.	St. Joseph's Villa (Rest Home), Catskill, N. Y.	30
52.	St. Mary's Hospital Summer Home, Norwalk, Conn.	80
53.	St. Vincent de Paul Convalescent Home (St. Elizabeth's), Spring Valley, N. Y.	40
54.	Sarah Schemerhorn House (N. Y. P. E. C. M. Society), Milford, Conn.	50
55.	Seaside Home for Crippled Children, Far Rockaway, L. I.	65
56.	Solomon and Betty Loeb Memorial Home, Eastview, N. Y.	108
57.	Spring Valley Camp (Henry Street Settlement), Spring Valley, N. Y.	21
58.	Sunnyside Farm (Margaret and Sarah Switzer Inst.),[18] Manasquan, N. J.	40
59.	Surprise Lake Camp, Cold Spring, N. Y.	70
60.	Urban League Convalescent Home (for the colored), North Pelham, N. Y.	8
61.	Valeria Home,[19] Croton, N. Y.	124
62.	Wavecrest Convalescent Home, Far Rockaway, N. Y.	35
	Total	3220

[1] Blythedale Home for Convalescent Children: Until September 1922 at Hawthorne, N. Y., with forty beds; temporarily working in connection with Convalescent Home for Hebrew Children at Rockaway Park, N. Y., with twenty-five beds, until completion of new building at White Plains, N. Y., about September 1923, when fifty-eight beds will be available.

[2] Campbell Cottages: Will take boys of eleven or twelve sent by New York Hospital.

[3] Caroline Rest: Designed chiefly to meet the need of convalescent mothers with children, particularly the young mother with first baby. Facilities for children are divided so that there are about eighty-four to ninety beds available for babies able to run about and older children. Usually there are about 114 beds, but this number is sometimes brought up to 120.

[4] Children's Country Home at Westfield, N. J.: Until the spring of 1923 open during the summer months only; has at present a total bed capacity of forty-eight, about 36 per cent of which is used for children from New York hospitals.

[5] Convalescent Home for Hebrew Children: Accepts girls from six to twelve and boys from six to ten. Occasionally takes younger child of four or five but will not take a girl of eleven if mature.

[6] Gould Farm: Only a portion of the guests are convalescent, and there is no medical attendance. The figures estimated above cover the approximate number of beds used by New York City patients needing recuperative rest.

[7] Health Home: Has approximately five hundred beds, forty of which are used for nursery children on outings; fifty to sixty for crippled children, and 125 for mothers with children up to six years. It is estimated that about 175 convalescent children are provided for while the other one hundred beds are for children other than convalescent. By adding to the 175 convalescent beds an average of fifty-five beds for crippled, we arrive at the approximate figure of 230 given above. Plans are being discussed regarding the advisability of changing the policy by keeping the place open the year round with emphasis on convalescent needs in the winter and extra provision for mothers and children in summer.

[8] Hill Top Camp: For children with tuberculosis and occasionally from the cardiac clinic of Presbyterian Hospital, divides the summer care into separate periods for boys and girls which gives total number of beds thirty-two for each.

[9] House of St. Giles the Cripple: At Garden City, L. I., had thirteen beds for girls and twenty beds for boys prior to completion of new building in May, 1923, when provision was made for sixty children—tentatively thirty boys and thirty girls.

[10] Isabella Home: Is "mainly a home for the aged and the convalescent department (fifty-six beds) is a small part of the work of the Home."

[11] Jewish Home for Convalescents: Running far below total capacity of 140 possible beds.

[12] Kinderfold—Goodhue Home: Reserves an average of three beds for use of convalescent girls among those sent there for placing out. Martha Summer Home, also maintained by the Children's Aid Society, reserves six beds for those of the girls who need convalescent care.

[13] Mineola Home for Cardiac Children: Will accept a small boy of sixteen but will *not* take a large or overdeveloped (adolescent) boy of fifteen. (Report claims to be the only home caring for the cardiac adolescent boy, however Burke reserves fifteen beds for the use of cardiac boys of fifteen and sixteen, and Nichols Cottage with six beds takes boys from ten to sixteen, sometimes using in addition a bed fitted up in the barn of Reed Farm for a large adolescent boy.

[14] James A. Moore Memorial Home: The policy has been primarily to limit ages from sixteen to forty (preferably professional workers) but an occasional girl of fourteen has been accepted from time to time. "These latter have not been sufficiently numerous, however, to allow a definite division in the total beds available."

[15] New York Orthopedic Hospital, Country Branch: Expects to build an addition during 1923 to allow provision for forty beds for adults. During 1922 there were four older patients ranging from sixteen to twenty years of age who occupied four of the hospital's twenty-six beds kept in reserve.

[16] Noyes Memorial Home: To be opened in fall of 1923. Former capacity twenty. Age limits same as St. Mary's Hospital. Future capacity undetermined.

[17] St. Andrew's Convalescent Hospital, having a capacity of thirty-two beds in the winter, has only eighteen beds at the Rest from May 16th to October 1st, thus making an average of 26.5 for the year. During 1922, the Home cared for four or five children under fourteen but their policy now is to confine themselves to the care of women of refined classes with a possible age limit of sixty years.

[18] Sunnyside Farm: Seventeen beds were available up to April 1, 1923, the time of completion of a new memorial building providing forty beds, which is to be kept open the year round if demand warrants.

[19] Valeria Home: Opened for use in summer of 1923. Provides for the care of approximately fifty guests in the cottage group for men, women and married couples. If experience warrants the continuance, the Valeria Home Summer Camp, with its provision for thirty-two guests, will be utilized to take care of the summer overflow from the main institution. The present tentative plan is to set age limit of sixteen to forty-five years.

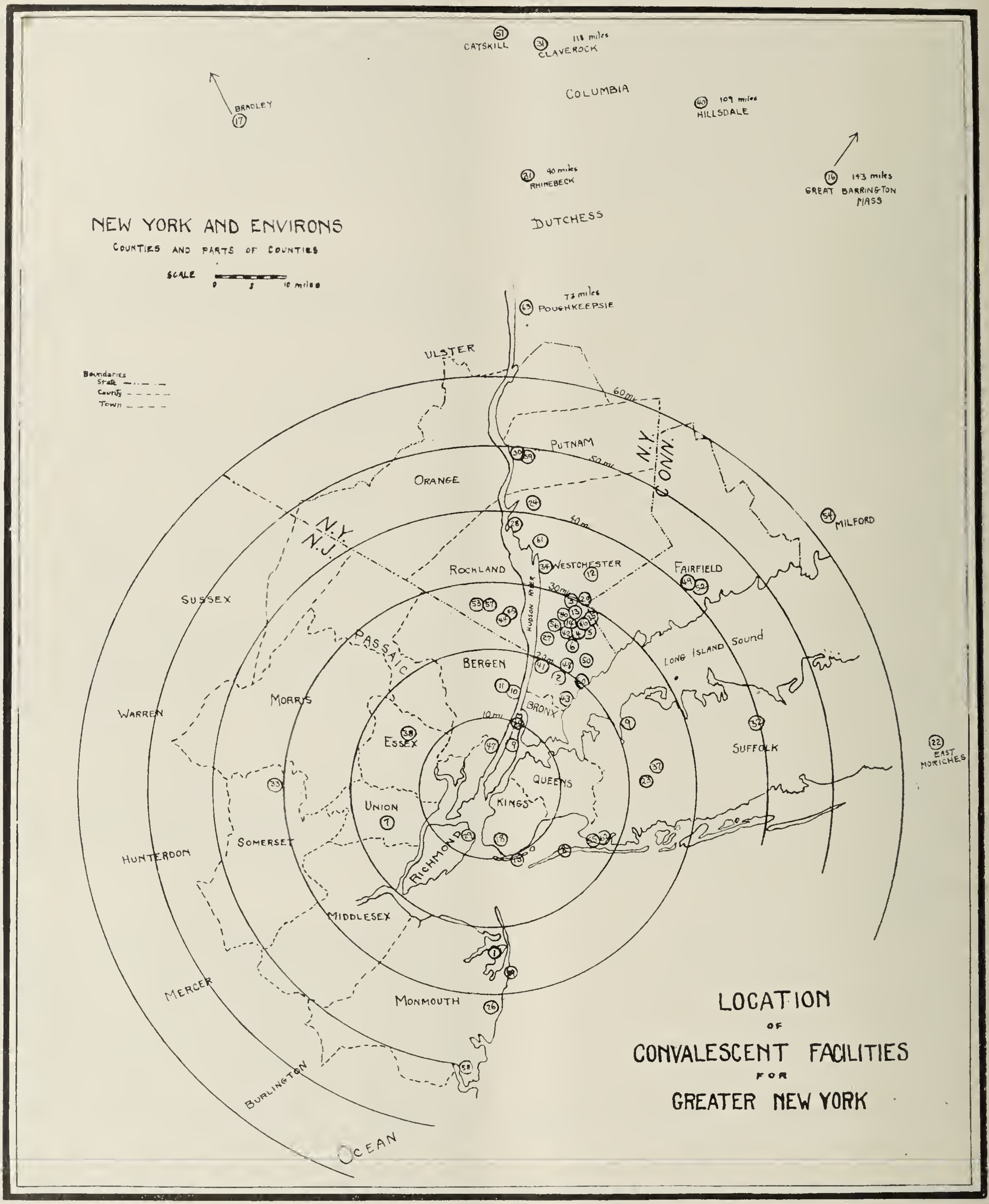
NEW YORK AND ENVIRONS
COUNTIES AND PARTS OF COUNTIES
SCALE
0
5
10 miles
Boundaries
State
County
Town
LOCATION OF CONVALESCENT FACILITIES FOR GREATER NEW YORK
CATSKILL
CLAVEROCK
118 miles
COLUMBIA
HILLSDALE
109 miles
BRADLEY
RHINEBECK
90 miles
DUTCHESS
GREAT BARRINGTON MASS
143 miles
POUGHKEEPSIE
73 miles
ULSTER
PUTNAM
ORANGE
N.Y.
N.J.
N.Y.
CONN.
60 mi
50 mi
40 mi
30 mi
20 mi
10 mi
MILFORD
FAIRFIELD
WESTCHESTER
ROCKLAND
HUDSON RIVER
SUSSEX
PASSAIC
BERGEN
BRONX
LONG ISLAND Sound
MORRIS
WARREN
ESSEX
QUEENS
KINGS
SUFFOLK
EAST MORICHES
UNION
SOMERSET
HUNTERDON
RICHMOND
MIDDLESEX
MERCER
MONMOUTH
BURLINGTON
OCEAN

FIG. 1.—Map indicating the location of convalescent homes.

UTILIZATION OF EXISTING FACILITIES

The combined institutions with facilities for convalescence, of which forty-five are open all year round, can give approximately one million patient days of service. Allowing ten per cent. for losses in time caused by renovations, temporary shutdowns, and intervals between the discharge of old and admission of new patients, the actual available or effective capacity of these homes was about 875,000 days in 1921. The aggregate number of patient days' care rendered was slightly over 626,000, or seventy-two per cent. of the effective capacity.

An attempt was made to gauge the extent of utilization of convalescent homes by classes of patients, but the lack of available medical statistics made this impossible in any detail. As far as the data go, the highest utilization is found in the case of orthopedic and cardiac children, babies and recent maternity cases. Women utilize convalescent homes to a larger extent than men.

The extent of utilization varies in different institutions and is subject to seasonal fluctuations; it is at the lowest ebb during the months of early autumn. The underutilization of the convalescent homes does not mean that we suffer from a plethora of facilities, but rather indicates a lack of coordination. There is no central office where information as to available facilities is registered daily and where all those concerned with the sick can readily obtain such information. At the present time, each hospital has a certain select group of institutions to which it refers its patients, but it is almost impossible for the individual social worker to keep in touch with all the institutions continuously as regards vacancies.

The maladjustment of the supply of facilities to the existing demand is another contributory cause to the underutilization of the convalescent homes. Many of the patients who need convalescent care and are unable to obtain it because of the nature of their illness, could in all probability be accommodated if there were a better understanding of the existing needs and a common desire to meet these needs irrespective of whether or not it is convenient to the individual institution. It seems wasteful to add further to our facilities until the existing accommodations have been made more elastic and better adapted to the demands for service.

A lack of synchronization of effort on the part of the placement agencies with the time of discharge of the patient from the hospital is another reason for underutilization. Frequently patients cannot be accommodated in institutions at the time they leave the hospital because no plan has been made for them until they are ready to be discharged, and it is difficult to get them to go to a convalescent institution after they have been home for a certain time. Some patients are altogether unwilling to go to institutions for convalescent care because of pressing domestic or economic reasons. Women who have children to take care of in their homes, or men who have families to support, are anxious to return to work as soon as possible, and refuse convalescent care.

The admission procedures in some instances are a deterring influence. Some of the homes do not admit patients on the diagnosis of the referring physician or hospital but insist that the patient apply to the institution in person for examination with a chance of being refused admission. Other institutions do not accept the social investigations made by the referring agency and send their own agents to ascertain the financial and home conditions of the applicants.

Then there is always the individual equation of the patient with his own likes and dislikes. Some institutions enjoy a very good reputation among the patients and others are not attractive to them.

It is apparent from the findings of the survey that there is a great social waste going on in connection with the underutilization of the convalescent homes, due chiefly to a lack of a common directing policy and of generally recognized medical and administrative standards.

ADMINISTRATION.

The annual expenditure for convalescent homes serving New York City amounts to approximately two million dollars. No exact figure can be given because in many instances there are no available financial reports such as are published by hospitals. Furthermore, in the case of certain institutions, the cost is borne entirely by an individual or group of individuals who do not care to disclose the extent of their philanthropy. The figure of two million dollars for the maintenance of all the convalescent homes is a mere approximation based on incomplete data.

On the basis of possible days of care which the institution can render, the per capita per diem cost is in the neighborhood of $2.00. The Burke Foundation reports an actual per capita cost of $1.97 and the New York Orthopedic Hospital $1.96 per patient in its country branch. The daily cost at St. Andrew's Convalescent Home is reported as $1.92. The Society of the New York Hospital reports that the daily cost per patient in its convalescent cottages is $1.73.

It may be of interest that in a group of thirty-one institutions with a total annual expenditure of $817,530, 34.9 per cent. was spent on salaries and wages and 27.8 per cent. on food. This distribution of items, when compared with a similar classification of hospital expenditures, indicates that the convalescent homes spend only a somewhat smaller proportion of their revenues for salaries and wages and about the same proportion for food. The other items of expenditure could not be properly segregated for comparative purposes.

The receipts from patients do not constitute a large proportion of the total revenue. The charges in the majority of the institutions are low. In some no definite rates are charged, but the patients are asked to contribute as much as they feel they can afford. Eight of the homes are primarily for pay patients, and only two homes make a charge for care and maintenance at all commensurate with the cost. The Burke Foundation is one of those which makes no charge to its patients, this being a provision in the will of the founder of the institution.

Many of the homes maintain farms or truck gardens where produce is raised for consumption in the institutions. The gardens are considered an advantage from the economic as well as the therapeutic point of view, because some patients are allowed to engage in the occupations incident to farming and gardening.

The buildings of many of the smaller convalescent homes were built for residences and later adapted to their present use. In the case of the larger institutions the structures were specifically designed for the purpose. The arrangement of accommodation generally followed is to provide wards for children and single or double rooms for adults. Some of the homes have sleeping porches and tents in the summer. Only one institution has a resident physician. All others have some arrangement with physicians residing nearby for either regular visits or calls as needed. All but two of the institutions have nursing personnels. Two institutions for children provide dental care for their patients.

There are no generally accepted standards of medical and nursing care for the various types of patients nor a scientifically formulated regimen of life. Curative workshops have not been generally introduced, nor is the value of occupation therapy admitted by all of the homes. In some institutions, it is part and parcel of the daily program, while in others it is considered a hindrance to convalescence. In some of the larger institutions mothers are taught how to care for and prepare food for their babies and the general care of infants. In most institutions, there are facilities for recreation, but neither recreation nor exercise have been developed in accordance with standards based on an accurate knowledge of therapeutic results for the several types of patients. Experimentation along these lines is being carried on at the Burke Foundation and the Mineola Home, where supervised work and games of various kinds are encouraged for cardiacs and other patients. Several of the institutions for children have teachers or kindergartners and also play directors.

Considering the tremendous opportunity of the convalescent homes to restore large numbers of patients to normal ways of life and economic usefulness, it seems imperative that a joint effort on the part of the institutions should be made to secure data which will serve as a foundation for a rational and effective development of the work in its administrative as well as its professional branches.

HOSPITAL EXPERIENCE.

In order to obtain a cross section view of the mechanism by which hospital patients are transferred to convalescent homes, a study was made of a group of records of patients selected at random in the social service departments of twenty-five hospitals. Altogether 3,236 records were read, which dated far enough back to include a complete history of convalescence. The cases studied covered dispensary cases as well as distinctly hospital cases.

Of the 3,236 cases, 980 or 30.3 per cent., were certified by the social service departments as needing institutional convalescent care. This need was determined by medical reasons in some of the institutions, on account of home conditions in others, and in some instances a combination of both was the basis. The study disclosed a marked variation from hospital to hospital with regard to the certification of patients as needing institutional convalescent care, indicating a lack of a generally accepted standard of selection. In some of the children's services, the variations ranged from eighteen per cent. to seventy-two per cent., and in the case of adults the variations were less marked although considerable.

It was surprising to find that the convalescent need was met in 81.8 per cent. of the cases. Here again, the several hospitals varied greatly in their ability to place patients; hospitals having their own country branches were of course one hundred per cent. successful. It is of interest that in the group of patients studied, convalescence was provided to the extent of 85.7 per cent. in the case of adult males, 81.2 per cent. in the case of children, and eighty per cent. in the case of adult females. The study further showed that the hospitals most successful in placing their patients were those in which the need was ascertained several days before the discharge of the patient. Of the 802 patients whose convalescent need was filled, thirty-two per cent. were placed in convalescent institutions on the day of discharge, 12.6 per cent. within three days afterward, thirteen per cent. within a week, and thirty-two per cent. were not placed for a week following discharge from the hospital, and for 10.4 per cent. there was no information on the records as to the date when they were placed in convalescent homes.

An effort was made to correlate the length of stay of patients in the hospitals with that in the convalescent homes, but as the length of stay in the convalescent homes was not given on the social service records in a large number of cases, the correlation could not be worked out. An analysis of the failures to secure the necessary convalescent care showed that the largest number was in the group of adult females, primarily because of their refusal to go to the convalescent homes on account of home responsibility. According to the medical classification, the greatest number of failures was among surgical cases, and also among neurological and orthopedic cases.

In 57.2 per cent. of the social service records of the patients certified as in need of convalescent care, there was no entry with regard to followup service; twenty-seven per cent. were followed up within two weeks after their discharge from the hospital, and fifteen per cent. in a period of three weeks to three months.

The study of records revealed a lack of any uniformity of approach to the problem of convalescence by the hospitals. There seems to be a need of a better formulation on the part of the hospital authorities of the types of patients which should be urged to take institutional care and under what conditions it should be carried out, and of a better timing of the discharge from the hospital with admission to a convalescent home.

SUMMARY.

Institutional convalescent care has evidently become recognized as a community responsibility in New York City. According to an estimate made by Dr. Brush in the April 15, 1923, issue of the Nation's Health, New York City maintains about fifty per cent, of all the convalescent homes in the country. The investment in these homes reaches many millions and the aggregate cost of maintenance amounts to a considerable sum annually. Some of the institutions have large endowments, notably the Burke Foundation, the Solomon and Betty Loeb Memorial and the Valeria Home, which is in the process of construction and which is to serve the need of the middle class. The outstanding need at the present time is a community policy with reference to institutional convalescence, a coordination of all the existing activities as well as a formulation of adequate administrative and medical standards. Until such standards are formulated and adhered to, many physicians and surgeons would hesitate to curtail the length of hospital stay of patients and to transfer them to convalescent homes. A central bureau of information or registry could be made very serviceable in promoting higher standards and in reducing the amount of underutilization of existing facilities.

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Historical Medicine

Egypt and Persia in the Days of Herodotus and Medical Problems Today

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Murray or Mahaffy, or perhaps it was some other one of those numerous British cousins of ours who have brought about the present revival of tolerance if not of interest in the classics, has laughed over the joke Herodotus tells on Hecatæus. Herodotus marvelled at the high antiquity of the Egyptians and, it must be confessed, was often somewhat taken in by their priests. Hecatæus had been to Egypt before him and it seems had been airing his snobbery in his pride of ancient lineage before the priests of Zeus, as Herodotus called them. He prided himself on his genealogy and boasted he could trace his origin back through sixteen generations to some god. The priests took him into a big room filled with wooden images of archpriests, noblemen, descended in a straight line for three hundred and forty-five generations and not the most remote could claim a god as his sire. Herodotus evidently chuckled over this for he remarks: "Such the priests showed me likewise, but I said nothing about my lineage" (1). As for ourselves, we are inclined to think both the Greek and the priests of the Nile were lying, but we may in this instance remark the tact of Herodotus as perhaps an example of the way he insinuated himself into the good graces of the priests. He must have done it all the more easily from being himself a pious man, not disposed to scoff at holy things, one too disposed to take seriously from scientific evidence the claim of the priests that Egypt and the Egyptians, not necessarily the wood in their statues, had endured already, some ten thousand years. At least, when Herodotus went to Egypt, the barriers that usually prevent the inquisitive traveler from penetrating into the innermost arcana of the civilization of less remote times under the rule of hierarchies and monarchies must have been let down for him. He seems at once to have got to the heart of it, to Sais and Heliopolis, where our medical papyri indicate to us was the fountain of learning and medical science. It may be doubted whether he got so familiar with the priests there that he could joke with them about their genealogy, their religion or their science, but he joked about them and came as near, on occasions, to scoffing at them as was possible for a sincerely pious man, though they did fill him with some stories we even yet refuse to believe after all the confirmation we have received from the archeologists in recent years. There is no doubt the priests of the Nile had lying and pretense reduced to a fine art when the Greeks first began to see the sights in the marvelous land of the Pharaohs, but modern archeology has reduced the number of apparent lies Herodotus in his gullibility has transmitted to us. The opening sentence of the *Papyrus Ebers,* filled with some of the medical lore of Egypt a thousand years before Herodotus travelled to see the sights there, spoke in its own name as though sheltered in the Holy of Holies, medicine cringing behind the robe of religion: "I come out of Heliopolis with the priests of het-āāt, Lords of Defense, Kings of Eternity and Salvation. I am come out of Sais with the mother madonnas who protect me" (11). These as Herodotus got it into his head, from what the priest told him, twisting Egyptian mythology into Greek beliefs, were sprung from Demeter, the mother of the gods, and Dionysius, (2) the wine god son of Zeus. As to the Heliopolitans who thus protected medicine, he says (3) they were the most learned of the Egyptians. In Sais too was safety to be found, the most fertile of grain lands, not far off in lower Egypt.

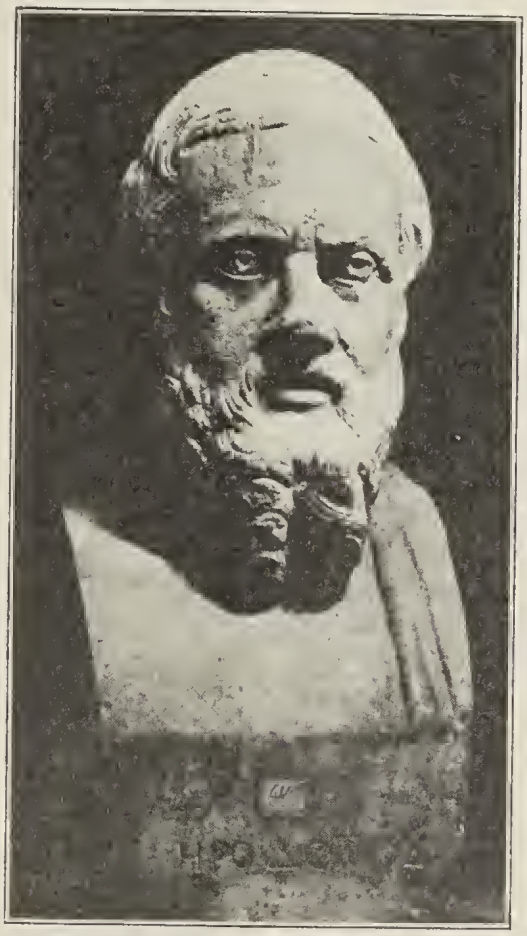
FIG. 1.—Statue of Herodotus. (From Greek and Roman portraits by Dr. Anton Hekler.)

In these columns I have quoted (12) from the *IV, Maladies of Hippocrates* and incidentally I have referred to some indications of the affiliation of this with the medicine we get in the Ebers and other papyri. The most prominent factor in the etiology of disease is said to be plethora—from errors of diet and regimen. There are others, of course, but this the author mentions and emphasizes. Now listen to Herodotus: "Those who live on the grain sown soil of Egypt are by far the most learned men in the history of mankind of any I have ever met. Their manner of life is such that they purge themselves by emetics and laxatives three days in the month, seeking health for themselves with clysters also, believing that diseases come from the injection of food" (4). Not only is their theory and practise here conformable to that of the Hippocratic book, but the detail of a three day purge finds a parallel in the three day period of the humoral doctrine of this book. "A cycle of three days presides over nutrition," is the summary Littrè gives of paragraph 42 in the *IV Maladies of Hippocrates.* This

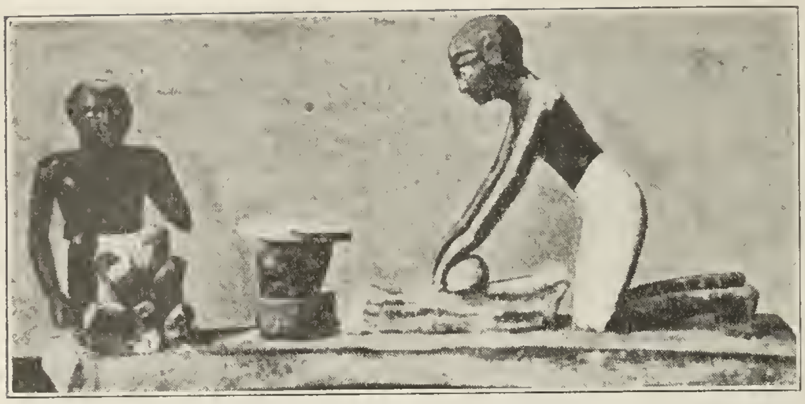

FIG. 2.—The bakers. (From Maspero's *Egypte*, a volume of the *Histoire Generale de l'Art*, 1912.)

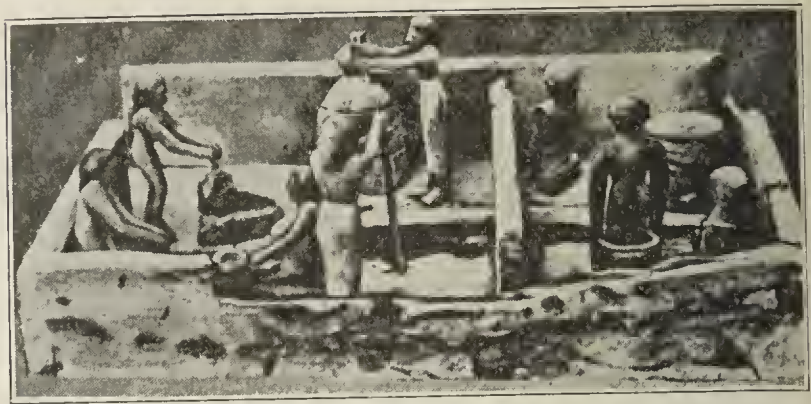

FIG. 3.—The kitchen. (From Maspero's *Egypte*, a volume of the *Histoire Generale de l'Art*, 1912.)

FIG. 4.—The mummy head of Ramses II. (From *Studies in the Paleopathology of Egypt*, by Sir Marc Armand Ruffer.)

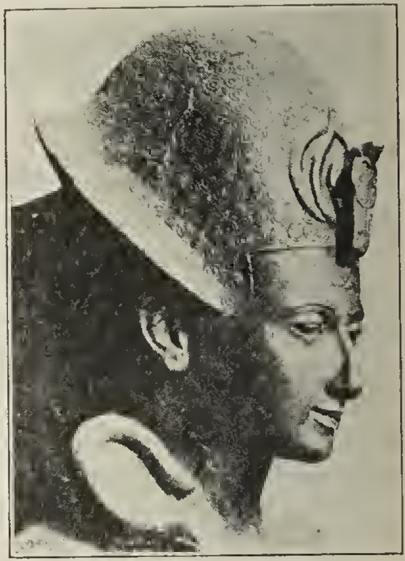

FIG. 5.—The portrait head of Ramses II. (From *Studies in the Paleopathology of Egypt*, by Sir Marc Armand Ruffer.)

practice was sound. Their therapy had a physiological basis in its periodical attempt to empty the gallbladder of those dwelling in the fierce heat of the sands along the Nile.

We get a glimpse in Herodotus (5) how the idea of the bile as the seat of the primary factors of disease etiology dwelt in the medical minds of his day, for he but echoes it. Near the Mæotian Marsh, the modern Sea of Azov branching off from the Black Sea south of what was once Russia, from which flows the River Don, the ancient Tanais, toward the Caspian Sea—along the Tanais was, according to Herodotus, a stretch of rich grazing country. Against the Scythians dwelling there Darius rashly led a Persian expedition: "Along these rivers I have named the Scythians get something for themselves and the grass which grows there for their cattle is the best bile producing in Scythia of all I have seen. In these cattle when opened it can be measured by the scales that thus it is." I confess I have given my own translation of this passage, in preference to that of Rawlinson or to that of Cary, but only in inserting the literal meaning of the words which exist there and make the passage significant to us on the scent of bile fads in the time of Herodotus have I ventured to differ from these laymen. It makes it quite apparent that the bile had its importance for an historian of Herodotus's catholicity which it would not have had except for the aura of medical theory which surrounded it. "How is your liver?" used to be a stage joke greeting the British exile when he returned from India. Though it was the appendix that was in the centre of the field even as a lay interest a generation ago, we have returned surgically to the gallbladder. "Thou art the joy of my liver," the Arab still exclaims, and for the Babylonian of old it held the mysteries of life, and from Babylon we imagine that part of the humoral doctrine received the extreme prominence quite evident in the etiology and pathology of Hippocrates. Grass and cattle, rich in bile, then, was a matter of interest to the commonality of readers in the day of Herodotus, though the turn of the phrase seems a little strange to us today, busy with another form of the same fad. The bile and the blood sera are coming into their own again. In the marshes of the delta of the Nile and in the Mæotian, where the grass grew rank for the cattle, it behooved men to keep the bile moving, to keep their bowels open and their faith in their gods for the rest of it.

There has been some discussion of late years as to the origin of wheat. It has not been very satisfactory either from an historical or a biological point of view. The weight of opinion seems to be that it originated, but it is better to say it was first used, as a food growing wild in the region of the isthmus of Suez, because in that region were preserved the most ancient records we have in archeology, very far back in Egyptian civilization, not long after the first of those images should have been made which the priests of Zeus showed Hecatæus and Herodotus. But there are a number of grains possible, if not very suitable for food, spoken of in early historical records by the nomenclature of which it is difficult to identify them with our modern wheat of commerce. There is an even larger number of varieties of this today. We can not always be sure the records on stone or in the papyri, despite our dictionaries, are really referring to the plant which now forms the staple cereal food of western civilization. Certain it is that no such preponderance as it now and with us presents existed in the days of Herodotus in Egypt or elsewhere.

In his day he said (6) that other peoples lived from wheat and barley, hidebound provincialists thinking their own way of living was the only way of living, but the Egyptians expressed the greatest contempt for any one using such stuff. They made their bread from rye or spelt (?), if this is the proper rendering, for Herodotus uses another term, "zeia." This word we have, with a twist, manufactured into the scientific term for our corn in America. The reader takes note, however, that the Greek words for the food of the Egyptians corresponded to that of the fodder the Greeks fed to horses. Despite the confusion one is reminded of that narrow-minded Colossus of learning who insisted in his dictionary that oats was a food for horses in England and for men in Scotland. On that subject then, the subject of intolerance most pronounced that man exhibits toward his fellow man, man's daily food, we find the Egyptians gibing at the Greeks and the latter countering with the Scotch rejoinder to Dr. Johnson: "Where do you find such horses and where such men?" Greece boasted of her men and the cattle of the Egyptian Delta were the finest in the world. The practical point for us here, however, is: "If it was rye that was the staple bread of Egypt when she was furnishing Greece with medical theories, is it any wonder, getting back to our humoral doctrine in the *IV Maladies of Hippocrates,* is it any wonder the cause of disease was the food? Our rye bread gives our western constitutions many a tussle with the belly ache. Any constitution which could flourish under the régime of the maza cake of the Mediterranean peoples in the time of Hippocrates differed from ours, but then man does differ from his fellow man, and the rye and barley husks and the stone grit Egyptologists find in the more cheaply embalmed mummies may have been good for them in life. We need not be too sure the Mediterranean people would have had less belly ache on finely sifted wheat flour. History after all lends no more support than comedy to the modern dietitian, who is so honest about his calories that he keeps scales on his breakfast table for his children's starches and proteins. Molière's imaginary sick man asks, scrupulous to follow his doctor's directions: "Doctor, if you please, how many grains of salt shall I put on this egg?"

Nevertheless, even if one man's food is another man's poison, one man's sufficiency another man's plethora, we may well believe purging was a relief as a sanitary measure. Despite the frills of ancient and modern dietitians man's digestive apparatus, as it has evolved since the days of the cave, may be considered the most wonderfully adapted biological structure familiar to modern science, and for mere man himself to seek to gauge it down to averages is absurd. If any considerable number of the race clustered around averages instead of being scattered along a line extending from one pole to another, and from the childhood of the Nile to the artificial life of our modern cities, man would have perished from the earth. A man's belly refuses to take much interest in averages or calories. Every belly is a law to itself, but it does need emptying.

How much the Persians brought to the land of Egypt besides a masterful organization of the political and hierarchical and educational bureaucracies, fallen into feebleness and decay, can not be told from Herodotus's pages altogether, but from other sources we can fill out the hints he gives us. It is plainer from him, however, that they furthered and increased the traffic in merchandise and ideas which had existed long before the Persian hegemony between the Nile and the Indus. On the establishment of this we can well believe some sanitary ideas came over the land routes as well as across the Red Sea to Western lands. The Persians themselves had a high notion of antisepsis, doubtless derived from their experience with tropical infections. Asepsis was a widespread ritual of many of the ancient rituals, but especially of the Persian. The sanitary code of their religious theory and practice can easily be traced in their epics. Their ethical precepts were derived from their religion. It is said the Persian boy was taught to ride a horse and shoot the bow and speak the truth. Herodotus says (1) they were taught to pay their debts and speak the truth. In these respects doubtless they had much to teach the Greeks, but the Persian was also taught a broader catholicity of sympathy. Not for him alone who in private was making his oblations and offerings did prayers ascend to the gods, but for all Persians and the king was the aid of Heaven sought (8). The Greek concocted a tale complimenting himself for the skill he showed in cheating the gods by taking to himself the thighs of victims to eat at the sacrifice and offering up the entrails to divinity, rib roast for him and tripe for God.

The Greek prayed for himself alone, the Persian for all mankind, as may be seen also in the Zend Avesta. Such were the Persians in ethics and in religion. As to sanitation Herodotus relates (9) that Cyrus carried with him on his Babylon campaign the water of the Choaspes, which ran through Susa, for his drink—and boiled. If Alexander had done that when he captured Babylon the world would have been different. For the Persians the cosmic elements were a part of the holiness of God. To defile them with the dead human body or to touch the dead body, except with certain precautions, was a mortal sin. "In the rivers," says Herodotus, "they neither pissed nor spit nor washed their hands nor allowed anyone else to do so" (7). Lepers they expelled from their territory. Babylon had a dawning conception of contagion and the Jews evidently shared it. The leper was unclean, impossible for purification and liable to contaminate all living things he touched. This idea of contagion together with the hatred of race was at the bottom of caste feeling in India. The conquered were not only hated and despised, but contagion raged among them in their misery. With an eye to our own danger we try to stamp out typhus among our enemies today. Altruism, the love for our fellowmen, an anchor cast out to windward with it all, advances hand in hand with sanitation.

Dead bodies were not allowed in Persia to pollute the earth either, much less, as in the Nile, to float in the current of the Choaspes. Its waters for Cyrus to drink were put in silver vessels and they were boiled. If Headlam (13) is correct in his interpretation of a line in Æschylus it was known to the Greeks of his day. Commenting on the news of Salamis the messenger brings to Susa, the poet makes the Chorus speak of bodies soaking in the sea and dashed against the rocks of the Ægean shores after the naval battle,—"they are torn by the dumb children of the *One* none should pollute," that is, the sea dogs of Greece, the sons of Poseidon, have left the Persian corpses to float in the water, rising and falling with the tide and polluting the element held sacred by the Persians. Twenty-five hundred years ago the Persians were further along on the road of sanitation than we were seventy-five years ago. In that period, as a matter of fact in less than two generations of men, by our triumphant study of infection, which we so plainly see the Persians entering on before their civilization had ended its short career, we have erected the beneficent fabric of sanitation which the best of our race are trying to extend to lands over which the Persians ruled all but 3,000 years ago, to lengthen the span of life of the men who now dwell there. But we have chanted our triumphs enough and I am going to turn to an aspect of the question of average longevity which has not received proportionate recognition.

FIG. 6.—The miller. (From Maspero's *Egypte*, a volume of the *Histoire Generale de l'Art*, 1912.)

We seem in civilized countries to have lengthened the average span of life, but statisticians say it has been done by keeping sickly infants alive until well up in middle life and that when a man has passed fifty he has a poorer chance of living until he is a hundred than he would have had a hundred years ago. By the time this essay sees the light I may have had something (15) to say of the ethnological aspects of euthanasia and something also of its social implications, but not of the special point of view from which the medical man views its ethical aspect. By our code, by the general sentiment of laymen, by the enactment of law, all of which are the outgrowth of historical tradition, we accept the central doctrine for us, that it is the duty of the doctor to keep the breath of life in his patient as long as possible. He has nothing to do with hope or despair, his duty is to prolong the life of the individual man regardless of his miseries in the past and disregarding the certainty of his sufferings in the future if he survives. The historical review of the question in its political and social aspects, besides the rather meagre gleanings we get from medical history, is sufficient to convince us of the unwisdom of placing in hands, other than those of the judiciary of the state, the function of deciding when a man has lived long enough. The reprehensibility of making this a medical question at all, I think, has been accepted in all ages since Hippocrates by the vast majority of conscientious practitioners of medicine. The instances to be found in Herodotus, as among the Massageate (10) who killed Cyrus and smoked cannabis indica, and in modern writers, where it is tribal custom for children and relations to kill the sick or aged in order to save them from further suffering, are all or nearly all culled from accounts of men in a very primitive state of culture. That practice has not stood the test of the experience of mankind, but that the knowledge of the experience gained by it in the history of man's past has slipped from the intelligence of the vast majority of men is not only astonishing but deplorable.

Certain strata of human intelligence stood aghast at Osler's playful suggestion that at sixty men should be chloroformed. This jest was such a novelty to them, so ghastly, so weird, with such a kernel of wisdom deep down in it, that his own life was made miserable by this unfortunate casual slip of a joke. He miscalculated the stage of culture of the men among whom he lived. They had forgotten their past. He wanted to raise the flicker of a smile by reminding men of a former sorry experience and he raised a tornado. The grim fact which was meant to elicit a grim smile that needed no comment did not dwell in the consciousness of supposedly intelligent men. This mistake in judging of the historical perspective of the men of his time was particularly mortifying to a man of his tactful personality, who felt himself, as in truth he was for the main part, in touch with the sympathies and thoughts of his fellow men. Those who knew him best may perhaps be able to trace a strengthening of his conviction of the utility to medical men of a knowledge of history, especially of medical history, to this episode.

The suggestion was a statute not a joke among the Ceians, according to Strabo (14), a fact and not a pleasantry among many tribes of primitive men; and recent travelers have told us we need not go back to Herodotus or Diodorus Siculus to find the practice in force. Not only does it emerge from ancient history but from modern ethnography as well. The Ceians, in an emergency it is true, made all over sixty drink hemlock, but we may be sure no English-speaking doctor will joke on this matter in relation to modern conditions until Osler's unfortunate venture is forgotten.

Yet there still remain some sober observations, which may be made by those not so famous as Osler, or so well loved, without drawing the fire of the public, but it is necessary, it seems, to refer to the fact, as I have done here, that the question of euthanasia is an old one and hedged by many social and political considerations in the history of the past. It is a burning personal question, too, at the back of many a man's mind. Read the *Life of Elie Metchnikoff*, wonderfully well written by his wife. It will then be seen the real problem which confronts us is not to live long but to die comfortably, and primitive man was striking right at the heart of it when he put his aged and sick to death. To lengthen the span of life is a sensible goal for modern medical science only when it holds fast firmly to the determination to abolish its asperities so far as they depend on the sufferings of disease, especially that of old age. A man may suffer when young with the prospect of enjoying the future, but there is nothing for it but the hemlock or the chloroform when a man is past sixty. To render old age palatable is very much more important than to lengthen it. If we are not going to engage seriously in that effort I see no reason we should not adopt the motto of a short life and a merry one. Why prolong life simply?

Life is not a question simply of statistics, it is a question of euthanasia. Life eludes statistics. On the face of the facts presented by living beings, the enormous variations in its phenomena, especially those of the human race, statistics are not a basis on which to build theories, except false ones, which have their value, however; they are adjuvants only to theories of any kind. They are of value chiefly when they deal with more or less homogeneous phenomena. For the individual man's diet and régimen they have small value. For reasons which I have alluded to also the medical man has perhaps no more right by his negligence to shorten the life of men in general than of a patient in particular, but there is no social or political reason why he should not put emphasis rather upon a comfortable death than a long life, especially in view of the fact that they are not necessarily antagonistic, indeed quite the contrary.

Herodotus tells us, at the dawn of history, a tale of the Massagetæ, which reveals to us how primitive men in his day were face to face with the problem, and elsewhere he lets us see that men, not primitive at all, were turning over in their minds this part of the problems of life and death, as well as we. The Massagetæ were not mere savages either. Cyrus rashly crossed the Araxes and burst in upon them and ended his own life, sword in hand, comfortably compared to Metchnikoff, for Metchnikoff, who labored so heroically to lengthen the span of man's life, twice in the course of his own attempted suicide and died a miserable death at last.

Health may be something which, as has been said by sententious and successful health officials, can be bought. Whether old age is something that can be bought is an entirely different question. The question first to be solved, which the Massagetæ solved in a way we shrink from and Osler joked about, is whether old age is worth the price. The matter of lengthening the *average* span of life has nothing to do with the longevity of the old, or very little to do with it and as little with the question of making it worth while. I will leave other gentlemen who have passed sixty to argue how valuable our services are to the State. I have my doubts about that, as did Osler, but emulating the prudence of Herodotus in suppressing the account of his genealogy, I shall say nothing about it. The longevity of a man I fear has more to do with his genealogy than the environment the health boards can buy for us.

Long life is more a matter of heredity than environment, and when the eugenists have settled just what kind of a man they are going to breed perhaps they will include this as a point to incorporate in his inheritance. If they do, I do not know how they are going to settle it with the health boards if they try to buy longevity as well as health. Sickly children who have had health bought for them until they have come to maturity are apt to leave descendants for whom it will have to be bought, too, and after a while the cost will be ruinous. Who can tell but a wiser generation will revert not only to the ways of Massagetæ and take seriously Osler's joke, but like the Spartans will throw sickly children into the duck ponds? Those at present beyond sixty can at least sincerely congratulate themselves they will not be called on to decide between the eugenists and the health boards.

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Elizabeth Fry, Pastor Fliedner, and Florence Nightingale.—Dr. Henry Barton Jacobs (*Annals of Medical History,* March, 1921), says that the work of Elizabeth Fry in bettering the lot of prisoners, the insane and the poor, and that of Florence Nightingale in the field of nursing are well known throughout the world, but the place of Theodore Fliedner, called pastor, who was a connecting bond between the two women, has not been so widely recognized, even by the medical profession.

Fliedner, born in 1800, was the son of a Lutheran clergyman of very limited means, and worked his way through the universities of Giessen and Göttingen by sawing wood, blacking boots and tutoring. While acting as tutor to a clergyman's family in Cologne, he sometimes assisted his employer in his parish and prison work, and in this way gained an insight into the hardships and evils of the lives of discharged prisoners, especially women. A little later he was made pastor of a church in a little village, Kaiserswerth, on the Rhine near Düsseldorf. He had hardly taken up his abode here when the velvet mill, which gave employment to most of the villagers, was burned and the people thrown out of work, resulting in their inability to supply money for the support of the parish. Rather than seek a position elsewhere, Fliedner stuck by his congregation and made a tour of several of the European countries in a successful attempt to raise funds to maintain his church. While in England he met Elizabeth Fry and was greatly impressed by her work at Newgate Prison. He returned to his little village inspired with zeal to better the lot of prisoners in his own country. He began his work in the Düsseldorf prison and founded the first German society of improving prison discipline. His greatest problem was the protection of discharged women prisoners, whom the social conditions of the times condemned to one possible source of livelihood—a life on the streets. He and his wife decided to begin the solution of this problem by opening their home as a refuge to discharged women prisoners. The first applicant speedily appeared. This was the first of the Kaiserswerth institutions, afterwards famous throughout Europe. During the winter nine more women sought refuge with the pastor, and a separate building was built for them. Some of these women had children, and the next step was to provide for them. An infant school, resembling somewhat the modern kindergarten, was established, and a little later, a school for the training of the nurse-teachers, who were also to work among the poor and sick in the community. So, in 1836, the Deaconess Hospital Kaiserswerth was opened without patients and without deaconesses, but "with faith abundant." A few days after the opening, the first patient, a servant girl, applied for admission, and soon sixty patients were under treatment. Fliedner's wife was the organizer and administrator of this school of nursing.

When Elizabeth Fry visited Germany, she was much impressed with the work being done at Kaiserswerth, and upon her return to England was instrumental in founding the nursing sisters. Florence Nightingale spent a fortnight at Kaiserswerth and was so enthusiastic over the pastor's work that she returned later to take the course in nursing given at his hospital.

Editorial Articles

PUBLIC EDUCATION IN MEDICAL MATTERS

The public has long been educated on public health matters, in fact, so thoroughly that widespread epidemics in civilized countries are unknown. This result would have been impossible without the cooperation of the general public. Domestic hygiene, too, is a question which is beginning to be more thoroughly understood by the masses, who now demand well built and properly ventilated houses. Infant welfare and the care and rearing of the child are other matters to which attention is paid nowadays.

All these questions, however, are comprehensible, to some extent, at least, to the man in the street. It is the chronic diseases and their treatment, preventive or otherwise, which puzzle the layman. But it is to the interest of everybody that the community at large shall be made acquainted with the symptoms of certain diseases, in order that they may be prevented. Cancer, for instance, can be treated successfully in its early stages, but the public should know what the premonitory symptoms are. In this country and in Canada these subjects are taught by propaganda, crude in many respects, possibly, but on the whole fairly effective. The advance of tuberculosis also has been stayed, partly by means of a more or less judicious public propaganda.

One of the most recent spheres of activity in preventive medicine is that of mental hygiene. Conceptions of mental disorder have changed greatly. It is now recognized that, if treated intelligently during the early stages, many cases of mental aberration can be prevented from proceeding further. It is also becoming a matter of common knowledge that mental disorders sometimes proceed from physical causes, or that physical causes are prominent factors in their development; that if these are treated successfully, recovery of physical and mental health will follow.

In the *Lancet* for October 20th is an article by Dr. J. G. Porter Phillips on the early treatment of mental disorders, in which he advocates the education of the public with regard to certain salient points. After stating that the secret of modern progress often lies in propaganda, he draws attention to the fact that in the United States and Canada much has been done to educate the public and to enlighten them as to the best means of facing the problems of early mental disorders. While lamenting that in Great Britain intensive propaganda is never likely to be carried to the extent to which it is carried here, he holds that there is no reason why an organized propaganda in Great Britain should not attempt to arouse the public conscience to its obvious duty in the matter of early mental disorder in the adult and defective mentality in the child. It should, in his opinion, be the duty of every psychiatrist to educate the minds, not only of patients and their relatives, but also those of members of the medical profession, to accept the fact that mental disorder is a common everyday illness, with which no stigma or sinister atmosphere should be associated.

Dr. Phillips also emphasized another sphere of activity greatly more in evidence in this country than in Great Britain, which is that attached to all mental out patient clinics will be found the highly trained psychiatric social worker. No doubt with this end in view, namely, that of better social organization, a National Council of Mental Hygiene has been inaugurated in England, to which body there have been elected to its executive committee men and women who from their training and experience are well qualified to undertake the intricate and onerous task of social readjustment in so far as it concerns the mentally unstable.

The education of the public is proceeding satisfactorily as to some phases of medicine and surgery. With respect to research work the general public is profoundly ignorant of its value and do not understand that although immediate results are not seen, it is essential to the successful prosecution of a campaign waged against disease. Fortunately, in this country, rich men are thoroughly cognizant of its importance and have given money prodigally to forward medical research work.

Before leaving the subject of educating the public on medical matters, it may not be amiss to say that medical men sometimes are in need of education. It is freely admitted that in the fight against disease a factor of the first importance is early recognition of the underlying cause. If a correct early diagnosis is made, grave results may be prevented. In the diagnosis of cancer the disease can often be detected in its early stages only by one experienced in its manifestations. Therefore, if a medical man is uncertain as to the diagnosis, a specialist should be called in. However, in country districts and when the patient is poor this course is generally out of the question, and medical men everywhere should be made conversant as far as possible with the early symptoms of disease. In this way alone, and by the education of the public, can treatment be rendered less empirical.

INFECTIONS OF THE RESPIRATORY TRACT

The *Monthly Bulletin* of the Boston Health Department for September prints an admirable unsigned article on acute infections of the respiratory tract, under the title A Serious Health Problem. In the cities and larger towns of this part of the country deaths and disability among persons in the productive period of life, incident upon such infections, the article states, constitute the most serious health problem that confronts us. Yet the prevention of deaths and disability from this source at present receives the least attention of any of our health problems. "The deaths, expense, and absence from productive occupations which are going to occur in Boston the next eight months from 'colds' and their resulting complications of infections of ears, sinuses, tonsils, lungs and other organs, will mean a greater relative economic loss to Boston than any tropical city in which yellow fever was endemic ever suffered from that disease. The yellow fever never killed the natives of such a city as colds kill us." The same might well be said of New York, though perhaps not in so extreme a degree, since the New York climate is milder and dryer than that of Boston. However, respiratory infections do cause a large proportion of our winter diseases, so we can listen with profit to these words of warning from Boston.

It is suggested that families adopt the practice in the home of boiling or sterilizing the family eating and drinking utensils after they have been used, instead of following the usual practice of "slushing" them about in the lukewarm water furnished since the war by most apartment houses, and that this be carried out as a regular routine procedure, and not left to be adopted until after some member of the family falls sick. To produce infection, something is usually needed besides the pathogenic organism. A lowered degree of natural resistance must ordinarily be present, and anything that tends to put the mucous membrane of the nose, throat or lungs in an abnormal condition tends to do this. Protein material in the atmosphere, irritating dusts, alkalies, a steamheated, dried out atmosphere, all these are agencies for harm. A steamheated habitation should have a degree of relative humidity comparable with that to be found out of doors on a cold day. Hardly do we ever find such conditions in houses and apartments of today. "Yet this might just as easily be done as in establishments where the artificial maintenance of a certain degree of relative humidity is necessary for manufacturing purposes."

People should be taught that, when they find themselves infected, the chances of serious complications may be lessened by applying to themselves the treatment that is efficacious in helping the body to overcome surgical infections, that is, rest in bed, especially when the temperature is abnormal. It means also rest of the infected part. "Violent efforts to clear a congested obstructed nose often serve to drive the infective material into the eustachian tubes or sinuses. Injudicious treatment of an infected throat also may favor the extension of the infective process."

The writer believes that the only real solution of the problem will be the bringing about in the general population of some sort of artificial immunity comparable to that now available for typhoid fever. He does not approve of research or experimental work being undertaken by an official state or municipal health agency, but he does advocate doing more work of this kind with a view to demonstrating some practicable solution of this problem of acute respiratory infections. "It is certainly the duty of every municipal health department to emphasize the economic seriousness of the problem and to endeavor by every means within its power to stimulate and encourage efforts to find a practical method for its solution."

THE MECHANISM AND PHYSIOLOGY OF SEX DETERMINATION AND THE ACTION OF HORMONES

Although it has been claimed by certain members of the medical profession that sex can be determined by will, or rather by following a definite procedure, this view has been generally rejected. It is believed that sex is an accident, dependent upon the laws of chance. It is a question of no moment to the community as a whole, whether an individual is male or female, so long as the numbers are approximately equal. But to the individual it is a very grave matter, or thought to be so, and thus sex determination has ever been a problem of quite absorbing interest. A great deal of literature has appeared on the subject, some illuminating and some confusing. A book by Dr. Richard Goldschmidt has been published recently which, while it presupposes a more or less intimate knowledge of the subject, especially from its modern points of view, discusses the question on the basis of sex as a Mendelian character. The main argument of the author is summed up as follows:

Every developing individual of a bisexual organism contains the substances whose action can call forth one or the other sex. A particular mechanism disclosed by Mendelian experiment and visible in the sex chromosomes, distributes these substances to the offspring in such a manner that half the offspring receive the substances in one proportion while the rest receive them in another, so that either the male or the female substances are present in excess quantity. These substances act like enzymes, proportionately to their concentration. The quantitative difference of the substances in the two groups of individuals is automatically responsible for either the male or the female enzyme completing the determining reaction first. This reaction is the product of specific hormones of sexual differentiation.

In connection with hormones, Prof. E. H. Starling, their discoverer, in the Harveian Oration given before the Royal College of Physicians of London recently, devoted a considerable part of the address to the consideration of the therapeutics of hormones. He pointed out that the ideal method of treating disease would be to control, by promotion or suppression, the growth of the cells themselves whose function it is to form these specific hormones, and he further pointed out that the power of controlling the growth of cells involves the solution of the cancer problem. Experiments on the growth of normal cells outside the body have shown that they can be stimulated to vie with cancer cells in the rate of their growth, or can be inhibited altogether, according to the nature of the chemical substances with which they are supplied. And it is also known that the growth of certain cells, such as those of the mammary gland or the uterus, is excited by specific chemical substances produced in the ovary or fetus. In Professor Starling's opinion, we may be able to find specific substances or conditions for any tissue of the body which may excite growth when this is retarded, or diminish growth when this is in excess. There seems also to be a possible relationship between Dr. Goldschmidt's views on sex control and the development of cancer.

Miss Stye's investigations on the inheritance of cancer in mice, referred to by Prof. R. G. Wells in the *Journal of the American Medical Association*, 1923, pp. 1017, 1103, show that the tendency to develop cancer behaves as a Mendelian recessive character. Moreover, the age incidence of the disease suggests that this may be another example of the quantitative efficacy, in time, of a veritable quality such as explains the changes of sex in moths and fowls. This would be in line with Dr. Goldschmidt's theory that each factor in the determination of sex is a dose which may diminish or be exhausted in the course of the individual's life. The female characteristics of a hen, according to this conception, may wear out, and it may become not only an anatomical but a functional cock. It is only a female because its female characteristics predominate and not because it possesses no male characteristics.

However, the determination of sex, after all, is a question of no particular significance or importance, that is, so long as the sexes are fairly equally divided. Perhaps, too, it is well that it is not in the power of man to control this matter. Neither, perhaps, is it desirable that we should be able to prolong our life far beyond the allotted span. But it is important that disease, disability and pain should be controlled or prevented, or the cutting off a man or woman by disease in the prime of life, which comes about by ignorance or disregard of the immutable laws of nature, the secrets of which are being continually revealed to us by scientific investigations. It is believed by many that in the study of the ductless glands rests the hope of the physical and mental salvation or regeneration of the human race, and in a return to a less artificial mode of living, especially with regard to diet. Discoveries thus far relating to the ductless glands have been remarkable, but as yet only the fringe has been touched. Their potentialities and possibilities promise so much that they almost stagger the imagination. It may be taken as decided that there is no recipe for getting a boy or girl at will. It has been decided that excess or deficiency of specific hormones have much to do with ill health and that as far as we know that hormones are identical throughout all the classes of vertebrates. It is further known that when the active principle is stored up in the gland and unaltered by the processes of digestion, that all the curative effects of the hormone can be obtained if dried thyroid is given by the mouth. Exact knowledge as to resistant powers of the other hormones to the action of the digestive hormone is not at present full or definite. However, the day seems to be approaching when the chemical constitution of all the hormones will be revealed, and when relatively colossal doses may be given by the mouth. When the exact action of the hormone is made plain a new era in preventive, curative and remedial medicine will be inaugurated. In fact, the reign of empirical treatment will have passed away forever.

WHAT IS A POISON?

Some twenty years ago Sir Michael Foster wrote: "Everything that gets into the body, that gets into the blood and can't be made use of by the body, does harm; it acts like a poison; indeed is a poison." He added: "Too much water, like too much anything else, is a poison."

Such a broad definition of a poison has not, we fear, entered the minds of most of us, and we have been brought up to believe that, as for water, there could be no such thing as its excess ingestion. The statement of the great physiologist seems to have had little influence with us, and everyday injury from excess of pork and beans, from cakes and candy, is hardly dreamed of. Salt has been looked upon with suspicion, also some things for which there is an idiosyncrasy, but patients have been urged to drink water by the gallon, as a therapeutic measure.

Of course, commonsense must wait on laboratory experiments, but now comes Rowntree who asserts that, both in man and animals, water ingested in excess leads to water intoxication which, being interpreted, means poisoning. This intoxication ends in death unless the excess consumption be stopped. The symptoms shown point to disturbance of the nervous system, and as the nervous system is most sensitive to blood changes this is to be expected.

There are, of course, many people who would be the better for drinking more water, but when an amount is reached where there is sufficient to induce good functioning of the bowels and the movements are soft, it is not well to push the intake further, and one should always consult the person's thirst. In hot weather too much water is often taken. The sweating apparatus is swamped in trying to get rid of the excess, so that the skin is bathed in warm water rather than covered with a thinner layer of rapidly evaporating sweat. The blood becomes too dilute with excess of water and undue languor and weakness result.

It is well to keep in mind that "everything that can't be made use of by the body does harm," and that probably the most common poisoning is by the most common substances we take into our mouths.

THE FIRST INTERNATIONAL HEALTH EDUCATIONAL CONFERENCE

The first International Health Educational Conference was held at San Francisco, from June 28th till July 6th, as a section of the World Conference on Education. The Health Conference was called in the name of the American Medical Association, the National Education Association, the American School Hygiene Association, and the American Child Health Association. Official delegates were sent by twenty-four countries, including Armenia, Belgium, Canada, Chile, China, Costa Rica, Denmark, France, Hawaii, India, Italy, Japan, Norway, New Zealand, Peru, Scotland, Spain, Switzerland, Poland, Turkey, and Uruguay. All the leading social welfare organizations of the United States were represented, and there were many famous authorities on science and medicine to address the audiences.

The two chief problems discussed at the conference were the health education of the child in the schools, and the training of normal students and teachers to instruct in health matters. These questions were discussed from every angle—nutrition, physical education, home economics, school administration, school nursing, and medical and dental work.

When one realizes that it was only five years ago that the health education movement was inaugurated in a nation wide campaign, it goes without saying that this movement has been a great success when it can command international attention. At that time the Child Health Organization of America, now the Health Education Division of the American Child Health Association, started a campaign to interest teachers in the teaching of health habits to children in the schools. The public heard of this through baby contests, health play, school lunches, and the like, and the idea has been developed until health education has become a part of the curriculum of every school of importance in the country.

DR. SHEEHAN'S ARTICLE ON PLASTIC SURGERY

In the article on Plastic Surgery of the Face and Neck by J. Eastman Sheehan, M. D., in the last issue of the JOURNAL, many of the illustrations were omitted due to lack of space. These illustrations will appear in the author's reprints. Dr. Sheehan is one of the surgeons on the staff of the International Clinic of Plastic Surgery. Fig. 1 of his article was taken from Kilmer.

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News Items.

Dr. Walker Honored.—The Women's Medical Association of New York City gave a dinner in honor of Dr. Jane Walker, of London, England, on Wednesday evening, December 5, 1923, at the Hotel Commodore.

Bronx County Medical Society Celebration.—The decennial banquet and dance of the Bronx County Medical Society will be held on January 9, 1924, at 7 p. m., at the Concourse Plaza, 161st Street and Grand Concourse, New York.

Dinner for Health Officers.—The Rockefeller Foundation gave a dinner at the Hotel Commodore in honor of a group of health officers representing eighteen foreign governments, who for the past three months have been in the United States under the auspices of the health section of the League of Nations for the study and observation of various types of public health organization. Dr. George E. Vincent, president of the Foundation, presided.

January Lecture Schedule.—The following lectures are listed for Friday afternoons at 5 o'clock at the New York Post-Graduate Medical School and Hospital: January 4th, the clinical use of basal metabolism, by Dr. Cameron V. Bailey; January 11th, radium therapy, with moving pictures, by Dr. George S. Willis; January 18th, a plea for a broader conception of dermatology, by Dr. Henry H. Whitehouse; January 25th, reconstruction surgery, with lantern slides and moving pictures, by Dr. Fred H. Albee.

Gouverneur Hospital Appointments.—At a meeting held by the board of trustees of Bellevue and Allied Hospitals, the reorganization of the medical service of Gouverneur Hospital was approved. Dr. Maurice Packard and Dr. Benjamin Schwarz were made medical directors to serve six months each; Dr. John Sheils and Dr. James Croce were appointed visiting physicians; Dr. I. J. Levy, Dr. H. Elwyn, and Dr. A. Hoffman, were appointed assistant visiting physicians; Dr. A. Fitzgerald and Dr. J. Stein were appointed adjunct assistant visiting physicians.

Foreign Correspondence.

LETTER FROM TOKIO

(From our own correspondent)

Tokio, *November 13, 1923.*

EXTENT OF DAMAGE FROM EARTHQUAKE

For nine miles along the north shore of Tokio Bay, and on both sides of the Sumida River which bisects the city, practically the whole of Tokio was wiped out, as a result of the earthquake and fire on September 1st. This includes six of the most densely populated wards of the city and the devastated area averages well over two miles in width. On the eastern side of the Sumida River, in the districts known as Fukugawa and Honjo, the poorer classes lived, but on the western side of the river, extending some places a mile into the heart of the most prosperous part of the city, were found a number of handsome residences and almost all of the wholesale and retail business districts of Tokio.

HOSPITALS DESTROYED

An estimate made about the middle of October gives the total value of buildings destroyed in Tokio alone of 1,463,790,000 yen; 224,567 houses were destroyed by the earthquake and fire, and of these 137 were hospitals of twenty beds or more. To appreciate what this meant in loss of hospitals to the city, one must remember that Tokio had only 236 hospitals before the fire with a total of 15,221 beds. A recent estimate of the 99 hospitals still standing gives the beds available at 8,559 at this time. Greater Tokio has a population of approximately four and a half millions. From this it will be seen that the actual number of hospital beds is much less than is the proportion in our large cities in the United States and abroad. It may be of interest in considering the question of the hospital facilities left available in Tokio to indicate the difference in the planning and organization of hospitals here in Japan as compared with the United States.

Before the recent catastrophe there were only three or four hospitals in the city with more than two hundred beds. The majority of the hospitals were really small nursing homes, conducted either by physicians for their own private patients, or connected indirectly with some teaching institution. Practically all of these hospitals were either two or three story frame or stucco buildings. The city authorities did not permit buildings for hospital service to exceed three stories in height. Largely for this reason, the percentage of deaths from the earthquake and subsequent fire was much lower than would have been the case if higher buildings of the Tokio type had been in use generally. Considering the violence of the first shock, and the promptness with which fire broke out in many parts of the city, the record of the number of patients saved is highly creditable to the faithfulness and prompt action of the staffs of the many hospitals throughout the city. In one centre near the University of Tokio, there were approximately twenty hospitals within a radius of half a mile, and every one of these hospitals was wiped out by fire. The University Hospital, an old building of the German pavilion type, spread over a large area, was not burned, but its laboratories were seriously injured and many parts of the buildings were practically destroyed. Baron Takagi's hospital in Shiba was entirely burned and this was also true of one of the largest private hospitals in the city, which has been conducted for the past seventy-five years by the Sato family, who for generations have been physicians.

DESTRUCTION OF ST. LUKE'S HOSPITAL

In St. Luke's Hospital we were exceptionally fortunate in saving all of our patients and the whole staff, including the servants. The hospital is in the centre of one of the most thickly populated districts of the city, protected on one side by the Sumida River. The building was of frame, three stories in height. At the first shake the building was badly damaged. Some of the stairways were so twisted and broken that patients could not be carried over them. In some places the walls bulged from the floors, leaving a gap of two or three feet, and floors sagged almost at right angles. There were about forty Japanese nurses on duty at the time, and with the prompt assistance of all the doctors and servants, the patients were hurried out of the building into the street in less than fifteen minutes. The violence of the shake was so severe that people literally staggered and fell on the streets and it is a remarkable tribute to the bravery of the staff that no accidents happened in the emptying of the hospital. The building was abandoned and the patients were taken across the canal which borders the old hospital lot, to the open parklike piece of property on the Sumida River, where the new St. Luke's Hospital was in process of construction. This lot covers approximately a city block.

During the afternoon fires raged all through the city but it was not until evening that Tsukiji, where the hospital stood, was threatened. Thinking the compound of the hospital perfectly safe, thousands of refugees poured into it from all parts of Tsukiji. In the immediate district, the first large building to be destroyed was the Hongwanji Temple, about four city blocks distant from the hospital. From this centre fires spread all through Tsukiji, and by ten o'clock in the evening not only St. Luke's was in flames, but the several residences of the staff, the school for nurses, and the dormitories which were grouped around the hospital buildings were all utterly consumed.

The crowds of people who had sought refuge in the hospital compound brought with them quantities of hand baggage in carts, rickshas and even by automobiles. These piles of baggage caught fire from flying brands, adding seriously to the terror and danger of the scene. Finally, so terrific was the heat that the hospital patients were lowered by the doctors and nurses into the concrete bays formed by the foundations of the new St. Luke's Hospital, in which several inches of rain water was standing. In these foundations, some five feet below the surface, the patients were kept the rest of the night, planks being placed over the foundation walls and over these blankets and *futons* kept wet by constant baling of water from the pits by the nurses and doctors, literally to keep them from being burned to death. Because the new hospital property had only a few buildings, and because all of these did not burn at the same time, only one or two people lost their lives in the grounds, but in Tsukiji, on the surrounding roads, many were burned. Also in the small gardens of private homes, where people had taken refuge thinking the gardens were safe, many lost their lives. Numbers jumped into the waters of the canal and the river for safety, and on to passing boats, some of which later caught fire and burned to the water's edge.

This story of the destruction of St. Luke's is more or less characteristic of the situation throughout the city during the night of fire. Few places had the wide area available here in St. Luke's for the protection of our patients, which accounts for the large loss of life in other hospitals in the thickly populated districts of the city.

TOTAL NUMBER OF DEAD

The total number of dead, according to the latest government statistics, is about 130,000, and the number of people still missing and unaccounted for is about 120,000, many of whom are probably dead.

NEW BUILDING REGULATIONS

The new municipal building regulations, issued since the fire, permit the erection of practically any kind of buildings for the next six months, with the provision that such buildings may be used for three years, and no permanent buildings may be erected for at least six months. This means that the hospitals which are able to afford any reconstruction are being put up in one story barracks, with small rooms for private patients, long narrow wards, and temporary operating equipment.

NO EPIDEMIC FOLLOWED DISASTER.

Although typhoid and paratyphoid fever has increased considerably during the past two months over the records of previous years, there is no widespread epidemic. This is true also of dysentery. The people are living much more in the open air than formerly because of the very poor housing conditions, and in some ways this may assist in the reduction of the curve indicating tuberculosis during the coming winter months and in the general well being of the poorer classes, as was the case after the disaster in San Francisco.

GIFTS OF HOSPITAL SUPPLIES AND EQUIPMENT.

The American Army brought in between five and six million dollars' worth of medical and surgical equipment and hospital supplies and food. The generous gift of drugs from the American Red Cross added to this hospital equipment will play an important part in meeting the present emergency, and also in equipping centres around which much of the hospital rehabilitation will be worked out. The Japanese Red Cross is building several barrack hospitals in different parts of the city, to be administered by their own staffs. These hospitals are to be maintained by the Japanese Red Cross for six months, when they will either be converted for private use, or removed to other districts of the city for housing facilities. In addition, the city of Tokio is establishing two small hospitals for maternity service and two for children, and a large number of milk stations throughout the city for undernourished children. Other plans are now under consideration for improving hospital facilities for the poorer sections of the city where the destruction of life and property was most severe.

It is stated that immediately following the earthquake and fire, approximately one third of Tokio's population left the city for surrounding country districts. Recently many of these people are returning. The chances are that during the winter months the needs for hospital service will be acute, and although the number of barrack hospitals now being erected will largely meet the situation, there must necessarily be considerable suffering from the lack of sufficient hospital accommodation and especially from poor shelter in the homes of the poorer classes.

PUBLIC HEALTH REFORMS PLANNED.

Up to the present, public health work in Japan has not been widely undertaken. The city authorities are now alive to the needs for this kind of work, and plans are under way to establish not only larger and better hospitals, but to institute fundamental reforms in the living conditions and housing of the mass of the people in the city so that better health conditions may prevail. These problems are much more difficult of solution here than in the United States, as the buildings in Tokio are of very flimsy construction, and with the narrow streets and overcrowding, it is almost impossible to enforce the necessary sanitary laws which the more progressive members of the medical profession in Japan wish to see put into effect.

The new Tokio will probably have much wider streets than formerly and an effort is being made to induce more people to live in the higher outlying territory which would assist in eliminating the congestion along the water front in the lower parts of the city.

LONDON LETTER.

(From our own correspondent.)

London, *October* 3, 1923.

HEALTH OF GREAT BRITAIN.

Sir George Newman, the chief medical officer of the Ministry of Health, issued recently the report of the health of the nation for 1922. In this report the somewhat interesting details of the state of the public health and of the steps to be taken to improve it are presented in a masterly and comprehensive manner.

There is no doubt that intense interest is being taken in other countries in the progress made by this country to improve the general health of the population. We are the pioneers in public health work and although in several respects America has passed us, the British Ministry of Health is an object of great concern in all parts of the civilized world. The inherent principles of public health are similar in all civilized countries, and the British annual report provides a lesson to all.

It is out of the question to attempt to deal with Sir George Newman's report at any length and only a few of the more important subjects debated will be referred to. In the first instance, it may be said that the campaign against infant mortality inaugurated in recent times continues to show good and encouraging results. Much remains to be done, but it has now been proved that, even in the most congested areas, when appropriate measures are set in motion infants and children thrive, and it is an excellent augury for the future when slums have been swept away and the conditions of life in crowded cities rendered more healthful. Tuberculosis and rickets, two diseases obviously largely the outcome of lack of sunlight and fresh air and of defects of food, are decreasing and will undoubtedly continue to decrease.

There are two diseases, however, which exhibit no signs of decrease but on the contrary are increasing. The first is cancer and the other diabetes. Figures are given in the report which indicate that cases of both cancer and diabetes are more numerous than ever before. While there does not seem to be any organic connection between these two diseases, evidence is accumulating that both are the result of errors in diet; at least so far as cancer is concerned, diet plays a part in its causation, and in diabetes diet plays an even more important rôle. It appears in fact that both are essentially diseases of civilization, but with regard to cancer, much has to be done before any dogmatic statements can be made. The laboratory method of investigating the cause of cancer has hardly come up to expectation, and if the Ministry of Health were to appoint a skilled committee to delve into the matter from the point of view of the habits of civilization, the step would be welcome. Moreover, such a procedure would tend to help laboratory workers, as the statistics gathered by a committee of this character would indicate the lines of research work to be followed.

Sir George Newman, in his report, refers to a paper on the possible influence of diet on the causation of cancer read recently by Dr. Monckton Copeman before the British Association for the Advancement of Science. Of course, if diet is an important factor in the causation and development of cancer there are definite forms of diet which are peculiarly calculated to aid in originating the malady, and by avoiding these foodstuffs, the disease may be prevented from gaining a hold, or its development may be stopped or checked. Up to the present time investigations and researches into the causation of cancer have been barren of any definite results, and therefore every line of research which suggests a clue should be thoroughly investigated.

A part of the report is concerned with smoke abatement, one of the most conspicuous evils of industrial civilization and an evil which is especially prevalent in this country. Legislation on the subject has been passed which has been more honored in the breach than in the observance. Sir George Newman now recognizes the gravity of the problem, stating that the injury done by smoke is constant and cumulative. He urges local sanitary authorities to act and it may be expected that effective measures will be taken to remedy an evil which has existed already too long to the great detriment of the general health.

POPULATION AND BIRTH CONTROL.

Among the many papers of interest read at the meeting of the British Association for the Advancement of Science was one dealing with birth control, a subject which is being widely discussed in this country at the present time. The population is increasing, while opportunities for gaining a living are diminishing. Unemployment is rife and until international affairs are more settled in this country, at any rate, this state of things is likely to continue. In order to relieve the situation several suggestions have been made, emigration to the Dominions being one of these. Unfortunately, this remedy has been shown to be of little use. In the first instance the Dominions wish for the best of the population only, those least to be spared. If emigration is to consist of the mentally and physically fit, schemes to aid emigration should be discouraged rather than encouraged.

A method of limiting our population to meet the altered situation was proposed some years ago, and in view of the conditions existing today the advocates of this scheme are more insistent than ever before. The method to which allusion is made is birth control. The desirability of restricting the size of families has been proposed by several well known men of science and members of the medical profession and appears to be finding a certain amount of favor with the general public. However, there is no space here to deal with the arguments for and against so debatable a question and only a passing reference will be made to an address given by Sir William Beveridge before the economical and statistical section on population and unemployment of the British Association. Sir William Beveridge attempted to prove that the increase of population in the British islands was neither dangerous nor abnormal, that the Dominions had room for all the surplus and that the war and that alone was responsible for the present distress. The paper was received with severe criticism from all sides and it was shown that statistics when applied to human beings were comparatively useless. It was pointed out, as mentioned previously, that while there is room in the Dominions for the surplus population of the country, the surplus mostly proceeded from the lower strata of society, which the Dominions are determined not to admit.

SLUMS AND DISEASE.

In the economics section of the British Association, Mr. J. J. Clarke, of Liverpool University, read a paper on the rehousing of slum dwellers. After giving details concerning overcrowding in various British towns and its disastrous results he suggested drastic measures to solve the problem. The gist of the scheme was that the unemployed of a suitable age should be compelled to serve in a military corps to constitute housing battalions on the lines of the dockers' battalions raised during the war. Prices of building materials should be fixed and where necessary materials should be commandeered. He said that these proposals might be considered as too drastic, interfering as they did with the liberty of the subject and striking at the foundations of all the economics of industry. If they were, the reply came from the depths of the slums and the haunts of men which permitted of neither decency nor morality.

THE SUPPLY OF INSULIN IN GREAT BRITAIN.

Professor J. R. McLeod, in whose laboratory Dr. Banting and his coworkers made their researches in diabetes, read a paper on the question before the meeting of the British Association. After saying what insulin could and could not effect, he stated that successful endeavors had been occasionally made to extract insulin from yeast. However, the yeast extracts were not consistently successful. It was surmised that in the course of bacterial action in certain yeasts one of the constituents of insulin was formed. He remarked that with reference to the future supply of insulin the sources in Great Britain were quite inadequate. The unit price would become lower as production increased. The action of the British Medical Council had assured to this country an adequate supply of guaranteed potency.

LATIN AMERICA LETTER

(From our own correspondent)

Balboa Heights, *November 19, 1923.*

UNUSUALLY HEAVY RAINFALL.

Heavy rains over the watershed of Gatun Lake on October 21st and 22d caused a rate of run off into the lake not previously attained since the opening of the canal and brought about an interruption of traffic on October 23d, when no ships were allowed to begin the transit of the canal between 6.30 a. m. and 3.30 p. m. The interruption was due in part to a strong current at Gamboa, where the waters of the Chagres River reach the canal channel, and in part to the use of the lock culverts to discharge excess water from the lake. Eleven gates of the spillway were opened and when the flood was at its height, the sidewall culverts at Gatun and Pedro Miguel locks were also opened.

The average dweller of the United States has no conception of what Nature can do in the way of rain once she sets her mind to it. The following table setting forth the rainfall in inches for a single week demonstrates the logic of the Isthmian superstition that children born in the rainy season have gills:

	21	22	23	24	25	26	27	Total
Colon	2.62	4.45	8.71	6.13	5.73	4.00	4.16	35.95
Gatun	3.02	2.85	9.34	8.66	4.05	2.24	4.79	35.17
Monte Lirio	4.21	2.54	9.67	4.95	4.72	2.88	5.81	34.97
Gamboa	1.20	1.54	5.94	3.31	2.80	.72	2.56	18.47
Alhajuela	.70	1.26	8.09	7.15	2.69	.37	1.63	21.50
Vigia	.16	1.07	...	...	...	...	2.14	21.91
Empire	...	...	...	3.30	1.80	.04	1.06	6.24
Culebra	...	...	4.20	2.72	2.33	.30	1.10	10.65
Rio Grande	...	...	...	2.34	2.03	.30	.88	5.55
Pedro Miguel	.44	.70	3.85	2.39	1.70	.16	.73	9.83
Balboa Heights	.27	.51	3.38	1.62	1.46	.05	.35	7.76
Balboa	.24	.48	3.26	1.95	1.53	.07	.37	7.90

In the United States a two inch rainfall is considered as heavy and .02 inch is hardly a sprinkle. If an area gets a two inch rain the water would be two inches deep if the ground were perfectly flat and no water sank into the ground; an ordinary farm of 160 acres would have 1.2 million cubic feet of water on it, a weight of 36.2 thousand tons. This would equal a lake 5 feet deep, 500 feet long and 464.6 feet wide. If this volume of water had to flow by one place in a stream three feet deep, in one hour at the speed of an ordinary stream, about two feet per second, a creek fifty-four feet wide would be formed. Reference to the foregoing table shows that at Colon, Gatun and Monte Lirio it rained more than two inches for a week and that the total rainfall in each instance almost equalled three feet. It is, therefore, not surprising that the surface of Gatun Lake rose from an elevation of 86.10 feet above sea level on October 21st to a maximum of 87.48 in the early morning of October 23d. This represents an increase in storage of six billion cubic feet. The discharge through spillway and lock culverts aggregated one hundred and seventy-five thousand cubic feet a second. It is estimated that at the height of the flood the water was entering the lake at approximately three million cubic feet a second, but as the heavy discharge had been begun early there was a margin of space sufficient to keep the final elevation within bounds. This was accomplished by having the meteorological stations up the Chagres River make constant telephonic reports of the amounts of precipitation, thus permitting the regulation of the spillways so as to discharge an amount of water which would keep the lake at a safe level. The fall of water was so great that the Chagres reached an elevation of 117.4 feet at Alhajuela exceeding its elevation at any time since 1909 when a flood record of 121 feet was set.

The situation was aggravated locally by small slides and washouts on the Panama Railroad, a break in the water main from the Chagres River, supplying Panama City and the towns at the Pacific end of the Panama Canal, and a break in the transisthmian duct line which interrupted telephone, telegraph and cable communication. Fortunately, no damage was done to the locks, spillways or the hydroelectric plant and in spite of all the difficulties which the enormous downpour created, the passage of ships through the canal was delayed only nine hours at the height of the flood on October 23d and for a brief period late in the afternoon of October 24th.

On the morning of October 28th, after it was believed that all the troubles resulting from the flood were over, a slide involving about three hundred thousand cubic yards of material developed on the west bank of the canal north of Culebra. It was approximately 1,100 feet long and at the point of greatest encroachment extended 150 feet into the channel. Ships were delayed only a few hours and there has been no enlargement of the slide since. Dipper dredges were immediately put to work clearing the channel and it is estimated that they will have completed their work by December 1st.

The employees of the Panama Canal met the emergencies caused by the terrific precipitation and demonstrated that the spirit which built the canal is maintained at its former level.

LANDSLIDE THREATENS HOSPITAL GROUNDS.

Three thousand cubic yards of earth and rock crashed down from the top of Ancon Hill during the heavy rains of October 9th, pushed through the rear concrete wall of the Ancon Hospital's bakery, swept through the carpenter shop adjoining the bakery and was stopped by the rear wall of the isolation ward where twelve patients were confined at the time. No injuries occurred. The lower ward of the isolation building was covered with six feet of earth, rock and fluid mud and the elevator machinery and the elevator itself were completely buried. The accident occurred about 3.30 in the afternoon during one of the heaviest downpours of an unusually rainy season, and is believed to have been caused by the sliding of a mass of earth and débris thrown out from the cut for the new army road which skirts the hill above the hospital grounds. Gangs of men, trucks and all necessary tools were rushed to the spot and after forty-five hours of continuous labor and the use of hydraulic mining, the gigantic mass of material which threatened the boiler house and the operating pavilion was completely removed.

Book Reviews

GASTRIC ULCER

Les Ulcères perforés de l'Estomac et du Duodenum. By H. Monder et G. Lauret. Paris: Masson & Cie, 1923.

Mondor and Lauret give a detailed description of the present day status of perforated gastric and duodenal ulcers. While in 1890 perforated peptic ulcers gave a mortality of one hundred per cent., very soon afterward surgery stepped into this field and the prognosis began to improve very rapidly. From 1890 to 1900, the mortality fell to seventy-five per cent., and from 1900 to 1910 to about thirty per cent. Nowadays the mortality fluctuates between ten and twenty per cent. The main point at issue is an early diagnosis and an immediate operation. The sooner after the perforation the patient is operated upon, the better the prognosis. Operation ten to twelve hours after perforation almost always leads to recovery, and operation after thirty-six hours gives a bad prognosis. The monograph is interesting and highly commendable.

THE COLON

Les Colites. By Prof. Paul Carnot, Dr. Paul Harvier, Dr. R. Frichl and Prof. Lardennois. Paris: Bailliere et Fils, 1923.

Contrary to the views of Metchnikoff and Arbuthnot Lane, that the colon is the cause of many evils, and that without this organ everybody could be happier and live longer, Carnot considers the large bowel as a very useful organ without which a perfect elaboration of the digestive process is hardly possible. The right portion of the colon serves to utilize remaining nutritive material and fluids, while the left portion is destined to serve as a reservoir for the fecal matter until an appropriate time for its evacuation.

Catarrhal, parasitic and ulcerative conditions of the colon are all minutely described and their treatment given. The monograph can be highly recommended.

BACTERIOLOGY

Principles of Bacteriology. Arthur A. Eisenberg, A.B., M.D. Second Edition. St. Louis: C. V. Mosby Company, 1923.

Of necessity a book containing 214 pages cannot be too exhaustive in its treatment, especially when an effort is made to cover so much ground as the present volume does. In preparing the text, which has been used for the teaching of nurses, the author states in his preface that he takes nothing for granted and leaves nothing to one's imagination, which is an uncommonly wise principle, considering the purpose for which the book is designed. The language is simple and easily comprehensible. The fact that the chapters in the second section of the book, dealing with special bacteriology, range from a half page to ten pages in length, is not a detriment to the book, but may rather be considered an advantage, because it demonstrates that Eisenberg has not attempted to make medical students and diagnosticians out of his pupils, a tendency which is much too prevalent, judging from the recent type of texts written for training schools. In teaching bacteriology to nurses, it is possible to show them only the high lights of the subject; they cannot be expected to attack it from the same viewpoint as the second or third year medical student, and such an approach can successfully be accomplished by the principles of bacteriology. Occasional typographical errors occur, as for instance, on page 100, Lubs's name is incorrectly spelled, but these are altogether minor matters.

LIVER ABSCESSES

Les Hépatites amibiennes et leur traitement. By Dr. F. Francon and Dr. J. Hutinel. Paris: Gauthier-Villars & Co., 1923.

Most of the liver abscesses are due, according to Francon and Hutinel, to amebic invasions. The amebæ are most numerous in the wall of the abscess, less so in the abscess cavity. The amebæ in the liver are never found in the cystic form. For this reason the treatment with emetine is most effectual and can be carried out successfully. The present monograph is a useful addition to our knowledge of liver pathology.

ROCKEFELLER INSTITUTE STUDIES

Studies from the Rockefeller Institute for Medical Research. Reprints. Volume xlv. 1923.

The present volume contains the reprints of forty-eight papers which have appeared in various medical journals recently, many of which have been abstracted in this Journal. The volume is representative of the type of work carried on at the Rockefeller Institute, and includes papers on pathology, bacteriology, chemistry, experimental surgery, general physiology, animal pathology, and some studies on diabetes, quinidine, arthritis, etc., from the hospital of the Rockefeller Institute.

CHEMISTRY FOR NURSES

A Textbook of Chemistry for Nurses. By Fredus N. Peters, A.M., Ph.D. Second Edition. Illustrated. St. Louis: C. V. Mosby Company, 1923.

The author has presented his subject in a very human and understandable fashion, and apparently great care has been taken in writing it so that it should not be over the heads of pupil nurses. Much of this result is accomplished by the many references to the practical chemistry of everyday life with which the nurse is familiar, although she may not have recognized that the science of chemistry was in any way involved. Each chapter contains at the beginning an outline of the matter to be studied, and at the end, a number of exercises for review.

OPHTHALMOLOGY

The Ophthalmology of General Practice. By Malcolm L. Hepburn, M.D., Lond., F.R.C.S. New York: Paul B. Hoeber, 1923.

In this little volume Hepburn gives considerable varied information to aid the general practitioner in distinguishing between cases which he can treat himself and those which he must refer to a specialist. Considering the large field of this subject and the interrelations of ophthalmology with questions of infection and immunity, neurology, clinical medicine, endocrine disturbances, intracranial disease, and blood pathology, the wonder is not that so much has been omitted and slighted, but that so much has been included. Of this there is a marked inequality both in the practical importance of the topics chosen and in the manner of their presentation. Like the curate's egg, parts are very good. It is a question whether, in this country, at least, the patient "expects his medical man to be an expert in all branches of medicine and surgery." The latter may be excused for ignorance of guttate choroiditis, retinal detachment, and hyphemia, all of which are discussed by Hepburn, if he knows something about the ocular complications of the infectious diseases of childhood, the eye symptoms of accessory sinus disease, and the rôle of ametropia and defective vision in school life, which are treated all too briefly.

Medicoliterary Notes.

An attractive booklet called *The Doctor's There, a Note of Appreciation,* is being distributed by the G. W. Carnrick Company, manufacturing chemists, of this city. It contains several poems by well known writers, paying tribute to the work of the physician, and a number of prose paragraphs on the same subject from such noted authors as Robert Louis Stevenson and Ian Maclaren. The selections are aptly illustrated with reproductions from line drawings.

* * *

Birth Control, What Is It? is the title of one of Small, Maynard & Co.'s new books. The author is Dr. Lydia A. De Vilbiss, of the United States Public Health Service. Dr. Adolf Meyer, in a foreword to the volume, calls it "a wise and temperate picture of the facts to be considered, of the limitations of our present means of education and methods of procedure and of the existing laws, and of the most sensible lines along which progress can become fruitful. . . . A carefully considered, documented and authoritative work on a subject in which the American public is increasingly interested."

* * *

Chronologia Medica, a Hand List of Persons, Periods and Events in the History of Medicine, by Sir D'Arcy Power and C. J. S. Thompson, is a small volume of 300 pages recently published by Paul B. Hoeber. It begins with about 5000 B. C. and ends with the death of Röntgen in 1923. Such a compact yet inclusive reference book on the history of medicine fills a long felt want.

* * *

The National Health Council has prepared a list of health films, which is a combination of lists sent in by health and welfare organizations, state boards of health, and producers and distributors of films. It includes the title, number of reels, the name and address of the distributor, the price, and a brief synopsis of each film. The list includes such subjects as child hygiene, public hygiene, communicable diseases, other diseases, nursing, anatomy, physiology, and first aid.—*Mental Hygiene Bulletin.*

* * *

A note in the *American Journal of Public Health* describes an ingenious method used in California in an attempt to abolish the use of roller towels in hotels. A sticker was devised, carrying a message as follows: "Roller towels may spread disease. This hotel is endangering your health and is violating the State Law of California." These stickers were furnished to traveling men through their societies, who cooperated eagerly. The demand for stickers was tremendous, with the result that within a very short time hotels all over California saw the light and abolished the roller towel.

* * *

Quebec was the first place in the world to initiate the Junior Red Cross movement. The idea originated with the Red Cross Society of the Province of Quebec in 1914, who enrolled children to help in the making of surgical dressings and other material for the comfort of the troops in the field.

* * *

Norah Hill has an interesting article entitled The Great God Play in the *World's Health* for August. She tells how the playground and recreation movement has spread, thanks to various agencies, among them the Junior Red Cross and the American Playground and Recreation Association, throughout almost the whole of Europe where there is such dire need of things pertaining to the lighter side of life.

* * *

A significant step forward in sanitary practice should follow the publication of a tentative report on plumbing by the United States Department of Commerce. The ultimate purpose is toward simplification and standardization of plumbing regulations. When those interested have had an opportunity to study this report, a model plumbing code will be prepared and submitted for consideration.

* * *

The Nation's Health for August is a number of unusual interest. Among noteworthy articles are: The Cripple's Place in Society Through the Ages, by Dr. Alexander Horwitz, who considers the cripple's worst handicap to be the social horror of deformity which produces a bitter introspection; A Scheme for Classification of Delinquency in Children, by Dr. Franklin G. Ebaugh, of the Philadelphia General Hospital; Organizing to Salvage the Mental and Nervous Derelict, by Dr. Joseph Smith and Jacob A. Goldberg, of New York City; and Practical Methods for Removal of Dust and Fumes, by H. H. Valiquet, who describes how the chemist and engineer must work jointly to detect and remove at its source the health hazard from air pollution.

* * *

Southern Italy has almost completed what is probably the most extensive water supply system in the world—the Apulian aqueduct, which it has taken sixteen years to build. The trunk and branches have a total length of 993 miles and supply 266 communities scattered over an area of 8,100 square miles, and having a population of about three million.

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As far back as the year 1580, Queen Elizabeth issued an edict prohibiting the burning of certain fuels in London because the health of her knights might suffer by having to breathe smoke and fumes. It is even recorded that a man was hanged for burning coal that smoked inordinately.—*Weekly Bulletin, Chicago Health Department.*

Practical Therapeutics

ZINC IONIZATION IN EAR, NOSE, AND THROAT DISEASES*

By Joseph B. Kanter, M. D.,

Brooklyn,

Attending Otolaryngologist, Brownsville and East New York Hospital, and Hebrew Home and Hospital for Aged, of Brooklyn. Formerly Instructor in Laryngology, New York Polyclinic Medical School and Hospital.

The treatment known as ionization consists in the introduction of various ions into the tissues of the body by means of the galvanic current. It may be divided into medical and surgical. By medical ionization we mean the introduction of various ions into the body for their constitutional effects or for their mild local effects. Experiments carried out on animals prove that ions can be carried into the body by means of the direct electric current and cause constitutional effects. Thus lithium and iodine ions have been made to penetrate the skin and have been detected in the urine and saliva. Likewise, the strychnine ion can be made to pass through the skin and cause convulsions, and the cyanide ion can be similarly introduced and cause rapid death. The entry of these substances is not by diffusion, because the mere application of these substances to the skin will produce no effect; nor are they effective if the pads are connected to the wrong electrodes.

The local effect of ionization is seen when an ulcer is treated by zinc ions. The application of a dilute solution of zinc sulphate to the ulcer produces no visible effects. But if the same solution is placed on a gauze pad connected to the positive pole of the galvanic current and the latter allowed to pass for ten minutes, the granulation tissue is seen to acquire a pearly white color, not only on the surface, but in the deeper parts. The white color is due to the coagulation of the albumin forming a compound of albumin and zinc.

By surgical ionization, also called electrolysis, we understand the use of the electric current for the destruction of tissue by caustic action of the ions. All tissues of the body contain water and sodium chloride. When the galvanic current is passed through the tissues of the body, if the positive electrode is of platinum hydrogen ions are formed and liberated at the anode and hydroxyl ions (OH) at the cathode. In addition there is some free hydrochloric acid at the anode and sodium hydroxide at the cathode. These ions and molecules have a caustic action. If the positive electrode is of zinc or copper, then zinc or copper ions are formed at the anode instead of hydrogen, and if concentrated, these ions act as caustics. When the electrodes are in the form of needles the current is concentrated, and when the needles are inserted into the tissue the current is still more concentrated, and the caustic action of the ions and the molecules is most effective and destruction of tissue will follow. This destruction of tissue is really accomplished by chemical action of the ions and molecules on the tissue. The advantage of this method is that by regulating the amount of current we can destroy as little or as much tissue as desired and the action is thus localized and under perfect control.

Medical and surgical ionization are really identical, the chemical action in both is the same, the difference being only in degree, the former being less and the latter more concentrated. Surgical ionization or electrolysis is successfully employed in the removal of superfluous hair, nevi, warts, benign and malignant tumors. Similarly, polypi in the nose and ear can be destroyed, and hypertrophied turbinates cauterized by this method. Medical, or the less concentrated method of ionization, has also a great field of usefulness. All chronic purulent conditions, in whatever part of the body, are greatly benefited by zinc ionization. The success of this therapeutic measure depends upon the accessibility of the part to be thus treated. Dr. Samuel Sloan, of England (1), is employing zinc ionization in the treatment of the female genital organs, and has devised a special apparatus for the ionization of the vagina, cervix, and body of the uterus. Elkin P. Cumberbatch (2) quotes Wallace, Ironside Bruce, Herschell, and Curtis Webb as using zinc ionization for the rectum and colon.

The use of zinc ionization in the treatment of diseases of the ear, nose and throat is not new, yet the literature on this subject is exceedingly meager. The first to employ this method was A. R. Friel in 1913 (3). He used one per cent. zinc sulphate solution and obtained excellent results. L. Kesteven, in 1917, employed thirty per cent. zinc iodide solution in all cases of middle ear catarrh, functional deafness, tonsillitis, and hypertrophy of the inferior turbinate. He also states that he has obtained good results in acute purulent otitis media and acute rhinitis. Iodine being an anion and zinc a cation, he reversed the current occasionaly to obtain the benefit of both the zinc and iodine ions (4).

Dr. Friel, during a number of years, has found that zinc ions alone are capable of arresting the purulent process in the middle ear and the nasal accessory sinuses and permanently curing the conditions. The zinc ions remain active in the tissues after the flow of the current has ceased, and exert their action for some time, so that the introduction of the iodine ions and the reversal of the current are not at all necessary. I have tried the zinc iodine solution in several cases and found it had no advantage over the zinc sulphate.

The zinc ions may be introduced by using a zinc electrode connected to the positive pole. When the current flows the metal passes slowly into solution and the ions are formed. This, however, would require a stronger current than the patient would tolerate, as well as more time. The best results are obtained by using a zinc wire as a positive electrode and a solution of zinc sulphate. I found the solution used by Friel very satisfactory. It consists of zinc sulphate 3.75 gms., glycerine sixty gms., and water two litres. A stronger solution is of no advantage.

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*Read at a meeting of the East New York Medical Society, October 18, 1922.

Elkin P. Cumberbatch in his book on medical electricity (2) states that "It must not be thought that more ions will be introduced if the solution is stronger, the stronger the solution the larger the proportion of undissociated molecules."

Regarding the penetration of the ions in the body, the same author has this to say: "The use of the electric current for the introduction of ions has this limitation—only the more superficial tissues receive them in numbers sufficient for therapeutic action. The deeper the part that requires treatment, the smaller the number of ions it receives. The lines of flow of the current diverge, and the ions take similar divergent paths, and so spread farther apart as they penetrate the deeper tissues. Other ions enter the blood and lymph streams and are carried away; still others combine with tissue ions and form insoluble compounds, and therefore pass no further." Also, the penetration of the ions depends upon the strength of the current, and the length of time the current is passing. Few patients can tolerate more than four ma. and with this strength of current, deep structures cannot be saturated with ions in any length of time.

Among the diseases in which zinc ionization is of special benefit are chronic purulent otitis media and chronic empyema of the frontal, maxillary and sphenoid sinuses. In acute purulent otitis media, the whole thickness of the mucous membrane is involved. The mucosa is edematous, and there is an exudation into the interstitial tissue which causes a swelling of the mucous membrane to the extent of several times its normal thickness. The antrum is usually involved, and often also the mastoid cells. The disease, therefore, is within the mucous membrane, and the bacteria are situated in the cells of the mucosa.

In chronic purulent otitis media the disease process is superficial, on the mucous membrane. Bacteria are in the pus only, not in the living tissue of the mucous membrane. The mixture of pus and bacteria fills the middle ear cavity and adheres to the superficial layer of the mucosa. The bacteria and their products, and the decomposition products of the serum and leucocytes, irritate the tissues with which they are in contact, and these latter respond by secreting more leucocytes and more serum. But the tissues beneath the superficial layer of cells are not involved and these form a wall of healthy living tissue. In other words, in chronic purulent otitis media the disease is in the discharge rather than in the tissue.

The same pathology obtains in affections of the nasal accessory sinuses. By means of free drainage and frequent syringing in some cases of middle ear suppuration and chronic empyema of the nasal sinuses the patients recover, but in a large number of cases they do not, and no amount of antiseptic and astringent drops and lotions will succeed in curing them. By means of syringing and free drainage we can remove the discharge but we cannot remove the microscopic layer of pus and bacteria that adheres to the surface throughout the whole middle ear cavity, and no drops or powders can be made to reach every part of the suppurating surface. In such cases zinc ionization is very effective. The results are invariably rapid, complete and lasting. The discharge ceases after a few applications and the ear remains dry.

In order to obtain these results it is essential that the zinc solution fill the entire suppurating cavity and come in contact with every part of the infected mucous membrane, while the current is flowing. In middle ear suppuration the opening in the drum must be large enough to allow the solution to pass freely into the middle ear. Polypi and granulations that obstruct the free entrance of the solution into the middle ear should be removed before ionization is attempted. This can be accomplished by surgical means, with the snare or curette, or by electrolysis. Cholesteatomata should be thoroughly removed before the application of zinc ionization. Chronic running ears due to constant reinfection through the eustachian tube, from purulent rhinitis and pharyngitis, or due to diseased tonsils and adenoids, cannot be permanently cured by ionization unless the causes of reinfection have previously been removed. Chronic rhinitis and pharyngitis must first be cleared up before ionization is attempted. Large and diseased tonsils and adenoids may not in themselves prevent the cure of chronic middle ear suppuration by ionization, but they may cause a reinfection of the middle ears, and it is advisable to remove these sources of infection first.

If the disease has involved the attic or mastoid the zinc solution cannot be made to reach these parts, especially when they are filled with granulation tissue, and therefore ionization alone is not sufficient to clear up such cases. Inflammation of the external auditory canal resulting from constant irritation from the pus from the middle ear is also benefited by ionization. To complete the cure, insufflation of an antiseptic powder in the external canal is of advantage.

Before citing cases it is well to outline the technic in the application of zinc ionization to the middle ear and nasal sinuses. The external auditory canal is wiped dry with cotton or, if thick pus is present, it is removed by syringing with hot water. The ear is then syringed with the zinc solution, and any air present in the middle ear removed by suction with the ear syringe. The patient is placed in the horizontal position, with the ear to be treated uppermost. A hard rubber ear speculum is inserted, filled with the solution, and the zinc electrode connected to the positive pole inserted. Care must be taken that the zinc wire does not come in contact with the wall of the external auditory canal, as otherwise a burning sensation will be felt by the patient at the point of contact of the wire with the skin.

As a negative electrode I use a steel spring three fourth inch wide made for me from a clock spring. It is shaped like the trousers holders used by bicycle riders with the binding post situated at about the middle of its convex surface. I have a number of such springs of different sizes to fit the wrists or legs of patients. In adults I apply the springs to the wrist and in children to the leg. The part is first covered with a thick layer of gauze saturated with salt solution and the spring applied.

The current is then started from zero and slowly and gradually increased until the maximum is reached—about three milliamperes. The current is allowed to flow for ten minutes and then slowly and gradually diminished until it reaches zero. The sudden increase of the current or its sudden decrease may cause a shock to the patient and should be avoided. The galvanometer should be watched during the time the current is passing through the patient, as without increasing the strength of the current the milliamperemeter needle may show a spontaneous and gradual increase in its strength. This is because the penetration of the zinc ions increases until the mucous membrane becomes saturated with them; this reduces the resistance of the tissues to the passage of the current. Sometimes the zinc ions form insoluble compounds with the tissue ions so that the current conducting ions are diminished in number and the milliamperemeter shows a reduction in current. The current should not be allowed to diminish below two ma. It may be increased to four ma. if the patient can tolerate this strength.

The zinc solution in the ear speculum must also be watched; if the eustachian tube is patent, the solution will run out through the tube into the pharynx and the milliamperemeter needle will move back towards zero, because there will be no conducting solution in the speculum. In such cases the solution must be constantly added so as to keep the speculum full. If the current is not increased above four ma. the patient experiences no pain. Some patients become dizzy and even vomit from stimulation of the labyrinth by the galvanic current; but this condition passes off in a few minutes.

The maxillary sinus can be ionized through an opening below the inferior turbinate. The antrum is irrigated, all pus removed, and then filled with zinc sulphate solution. The zinc wire can be introduced through either a hard rubber eustachian catheter or through a soft rubber tube. A better method is by drilling an opening in the anterior or facial wall of the antrum with the Halle trephine, as in the Canfield operation on the antrum. Through this opening the antrum can be inspected with an ear speculum, or, better still, with an electric auroscope, and if any polypi or granulations are present they can be removed with a curette before ionization is attempted. Through a vulcanite ear speculum, the zinc electrode can be introduced after the antrum is irrigated and filled with the zinc solution.

The other nasal sinuses can be ionized by Dr. Friel's method as follows: A small air balloon is introduced empty into the posterior choana or posterior nasal space and then inflated to close the opening. The frontal or sphenoid sinus is then filled with the solution, and a zinc wire, protected by a coat of collodion or a thin soft rubber tube, inserted into the sinus. Or the whole nostril may be filled with the solution, and the zinc wire introduced through a vulcanite ear speculum, thus ionizing the whole nasal cavity including the sinuses.

Nasal polypi should be removed, and if the ethmoid cells are involved they should be exenterated. Very often it is necessary to correct a deviated septum and remove the anterior end of the middle turbinate before the frontal sinus can be entered. According to Professor Hajek the frontal sinus cannot be probed in fifty per cent. of cases, and the proportion of cases that can be ionized without operative interference is considerably less than that. Therefore ionizing the sinuses through the anterior nares is a much simpler procedure, though the results are not so satisfactory.

During the past four months I have applied zinc ionization in fifty-two cases of chronic purulent otitis media, all private. The duration of the disease was from three months to fifteen years. In thirty-four cases the disease was confined to one ear. Of these cases five patients did not appear for a second examination. Of the other twenty-nine, all of whom called at my office between three and five days after treatment, twenty-one had perfectly dry ears, after the first treatment. In four cases the ears were dry after the second application. In two cases the ears dried up after the third treatment; in one case, after the fourth treatment; and in one case, that of a child of two years, the patient failed to respond to six treatments. This patient had diseased tonsils and adenoids and a mucopurulent discharge from the nose. Subsequent to the removal of the tonsils and adenoids the ear cleared up without any further treatment.

In eighteen cases there was chronic suppuration of both ears. In eight of these, both ears were dry after the first treatment; in two, after the first treatment of one ear and the second treatment of the other; in two cases, after two applications to one ear and three to the other. In one case one ear dried up after the first treatment, and the other after the fourth treatment. In another case, one ear remained dry after three applications and the other ear was still running after five treatments, the cause for which could not be ascertained. Four patients did not return after one application to each ear.

Tabulating the findings given above, we obtain the following:

Number of ears treated (thirty-four, disease in one ear; eighteen, disease in both ears)......	70
Results not known (did not return after first treatment)	13
Number of ears, results known.................	57
Ears dry after first treatment.................	40
Ears dry after second treatment...............	8
Ears dry after third treatment................	5
Ears dry after fourth treatment...............	2
Not improved (this includes case that cleared up after tonsillectomy)........................	2

Among the cases were three that had polypi which I removed before applying ionization. Also one case in which the ear was running two years after a radical mastoid operation was performed. I also applied zinc ionization in a number of cases of acute purulent otitis media, but the results were not definite. Perhaps the disease process was shortened, but no proof was possible. I do believe, however, that in the declining stage, if the opening in the drum is sufficiently large to admit the zinc solution, a cure is hastened by ionization. I also applied zinc ionization in two cases of empyema of the antrum both of which cleared up after the first treatment.

From the foregoing statements it is seen that over seventy-five per cent. of cases of chronic purulent otitis media are cured after one application of zinc ionization, and over ninety-five per cent. after one to four treatments. A. R. Friel obtained similar results with approximately the same percentage of cures in 304 cases reported last February (5).

The question will now be asked; Is the cure permanent? Dr. Friel has this to say regarding it: "Zinc ionization is an antiseptic procedure. It is not a method for producing immunity. Immunity in these cases is a condition acquired as a result of infection or inoculation, and presumably the tissues in the ear have been inoculated to a considerable extent by the products of the germs which have been so long in contact with them. As a matter of experience, when the patient has recovered from the otorrhea by ionization, a recurrence is uncommon unless the patient gets a fresh infection by bathing or a severe cold" (6).

The great advantage of zinc ionization in chronic purulent conditions, especially in the ear, is that it is a simple procedure causing no pain and discomfort to the patient, requiring no elaborate apparatus, and, what is more important, is eminently successful in so large a percentage of cases. From the experience of those who employed this method for a number of years, as well as from my own short experience with fifty odd cases, zinc ionization ranks highest as a therapeutic measure in chronic suppuration of the middle ear and nasal accessory sinuses and deserves to be employed more extensively than it is at present.

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335 Stone Avenue.

A CONVENIENT METHOD OF CLEANING BLOOD COUNTING PIPETTES

By A. E. Renner, M. D.,
New York.

By using a rubber bulb ear syringe, whose end is cut of sufficient length to fit the end of a blood counting pipette, solutions can be more easily and safely aspirated by hand than sucked by mouth. A much greater force is also in this manner available and furthermore every procedure is directly visible in the bulb and throughout the calibre of the pipette. Alcohol and ether must be aspirated with caution, because of their deteriorating effect upon the rubber bulb.

With a little practice it is possible to judge the force that is necessary to draw up a required amount of fluid into the glass pipette. It has been our custom to fill the ear syringe with tap water preparatory to affixing its end upon the glass pipette. Thus the entire contents of the rubber bulb can be forcibly blown through the pipette and a very complete, gross cleaning of the pipette results. It may be necessary to repeat this maneuvre several times before all vestiges of blood are sprayed out.

When ether or alcohol is to be sucked into the pipette by means of the ear syringe, the latter is attached to the pipette, which is then inserted into the solution and the ether or alcohol are drawn up carefully so as not to go beyond the glass into the rubber bulb.

Finally, by allowing the syringe to suck some hot air from the flame of a Bunsen burner, it is again attached to the pipette end and by repeated pressure upon and release of the bulb, the hot air is forced through, completely drying its bulb and calibre. This method does away with using the mouth, at best not only an uncleanly, but also a dangerous procedure.

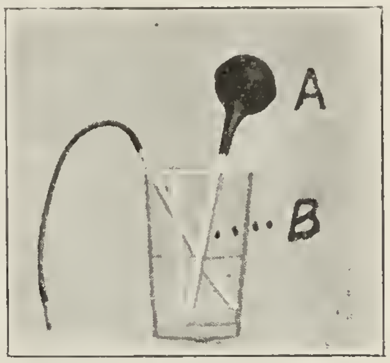

Fig. 1.—A, rubber ear syringe; B, blood pipette.

By dint of practice, the author has also been able to collect blood from a patient with the ear syringe and has adapted this method in preference to the rubber tube and bone mouth tip.

943 Lexington Avenue.

Symptomatic Treatment of Tuberculosis.—Edward O. Otis (*Boston Medical and Surgical Journal,* September 13, 1923) treats cough at first with simple remedies, such as chloroform water, or tablets, lactucarium, acacia, flaxseed tea, and sedative syrups, such as those of almonds and wild cherry. Inhalations or sprays are helpful if the upper respiratory tract is irritable; occasionally creosote may help. External applications, such as iodine, mustard plasters, or even a small blister, are other expedients; failing with these simple remedies, some form of opium will have to be employed. The socalled emetic cough after meals causing vomiting demands careful attention. The meal most frequently lost is breakfast and when this occurs the writer's practice is to give the patient on awakening a hot drink of some kind; this will excite the cough and the elimination of accumulated secretions and later breakfast may be taken with less danger of losing it. Sometimes a piece of ice in the mouth is of value, or chloroform or cocaine before meals. As a last resort, codeine or heroine an hour before meals may be required; if there is laryngeal irritation medicated inhalations may be tried, or an application of iodine and iodide of potash in glycerine to the pharynx every day or two. Hemoptysis is treated by ice in the mouth and an ice bag on the chest; if there is comparative hypertension the nitrites are indicated. If there is hypotension, adrenalin or pituitrin by hypodermic administration is indicated. Some opium is likely to be needed to allay cough and nervousness and prevent dislodgment of the forming clot. The one great treatment of fever is rest; the one drug employed is pyramidon in five or ten grain doses once in twenty-four hours. As to diet and avoidance of digestive disturbances, an ample mixed diet in three daily meals fulfills all requirements. Pain rarely has any underlying cause and is treated by mustard paste, iodine, heat, and dry cupping; of internal medications the most useful are salicylates, aspirin and phenacetine.

Letters to the Editor.

WOMEN IN MEDICINE

Brooklyn, N. Y., *December 4, 1923.*

To the Editor:

I have read with very great interest your editorial on Women in Medicine, which appeared in the issue of the New York Medical Journal for November 21, 1923.

You were kind enough to say that "on the whole women who have chosen the medical profession appear to have justified the selection of a career." You say, also, that "preventive medicine offers better facilities for women than ordinary practice."

You give to women the credit for being intuitive and admit "the great importance of this quality in diagnosis and prognosis when reinforced by training." You deserve credit for these laudatory statements but, do you not stultify them by subsequent statements not based on up to date knowledge of facts?

You say, "there are few women in general practice." The fact is, that the census of 1918 gives the name and address of more than seven thousand medical women in the United States, and the number in England is even larger, I believe, in relation to the small area covered.

You further limit them by saying "they appear *only* to be adapted for certain kinds of medical practice," and this lack of adaptability was shown during the war more with women than men." The facts are that a large number of medical women filled the places left vacant by medical men who served in military hospitals in this country, in England and in France. One woman physician, whom I know personally, carried on her own large general practice and that of her husband during the entire war, and this was done without either *mental* or physical breakdown.

Furthermore, the War Committee of the Medical Women's National Association, at the beginning of the war, raised funds, got together a body of medical women, surgeons, specialists and general practitioners, as well as a large corps of nurses, and sent them to France where they took the entire medical charge of the civilian population in the large district cared for by the Association for Devastated France. These doctors opened hospitals and clinics, conducted a weekly automobile clinical service in all the smaller towns of the region, sending doctors, nurses and medical supplies, and instruments for the treatment of the hundreds of sick people who swarmed into the rooms opened in town halls, etc., to accommodate these clinics. Hundreds of operations, major and minor, were performed in the hospitals by women surgeons, cataracts were removed, women dentists cared for teeth, and this work was continued till the end of the war, when the men physicians returned to resume the work.

Farther on in your article you say, rather apologetically, "In the factors which make for success in *any sphere* of life it may be that women are not as well equipped by heredity as men." If this were true, one would be tempted to ask, do women inherit nothing from their fathers?

Sir Humphrey Rolleston, from whose address at the Royal Free Hospital in London some of these statements in your editorial are borrowed, advises "women students to remember that they are more liable to mental breakdowns than men." In forty years of acquaintance with women medical students I fail to recall one mental breakdown among them, and it has long been known that women continue the practice of medicine to a greater age, as a rule, than do men.

The last bomb thrown at medical women in your editorial, whether manufactured across the Atlantic or in America, is, to say the least, filled with a poison gas, unworthy of its source. May I repeat it? "It would appear that here is a *definite place* for women in medicine *but* that at any rate in existing circumstances they are not nearly so well fitted as men to practice medicine. In the course of time a type of woman may be evolved who will equal man as a practitioner of medicine, but that time has not come yet."

I leave it to your readers to decide whether, as a matter of fact, this "is very laudatory" to women physicians, as you suggest in your letter to me.

Eliza M. Mosher.

Hotel Montague.

PLEA FOR AID FOR LEIPZIG MEDICAL STUDENTS

Leipzig, *October 9, 1923.*

To the Editor:

The miserable plight of the majority of the Leipzig student body forces us, with heavy heart, to make known to the good people in foreign countries the conditions here and to implore them to help us. Because of the dreadful money values, a great many of our young medical students do not know what they shall do to finish their studies which they undertook under better conditions. With almost superhuman strength they conduct the fight for their existence, and do not stop at any kind of work, in mine or factory, but the undernourished body frequently cannot stand the hard labor, and they can consequently do little studying.

Germany needs today more than ever to educate the sons of the middle class, from which so many intellectuals and physicians have come. If students of this class are deprived of education we lose something that is irreplaceable. In our residence an endowment through the will of a deceased philanthropist has been established for worthy needy students. These students receive from this benefit fund, in amounts according to his needs, textbooks, paper, food, clothes, etc. In this way every cent of the money goes to the neediest and is used to best advantage.

I cannot say in words how grateful we would be if you or your friends would send us help in our work to aid these students. In this way you would also render the students and the country an inestimable service.

(Signed Dr. med. Werner Spalteholz,
Professor an der Universität
Mozartstrasse 21

Abstracts from Current Literature

INFECTIOUS DISEASES.

Observations on the Oculocardiac Reflex in Diphtheria.—Jesse G. M. Bullowa (*Archives of Pediatrics,* May, 1923) states that orbital pressure induces slowing of the heart by reflex stimulation of the vagus. In severe diphtheria intoxication, the heart is frequently refractory to vagus inhibition. Failure of the heart to respond by slowing, on stimulation through the vagus, as by orbital pressure, indicates either a refractory heart muscle or such an intoxication of the sympathetic that the vagus is already unopposed. True vagus paralysis does not occur in diphtheria.

Intravenous Injection of Diphtheria Antitoxin.—Paul Iversen (*Lancet,* April 7, 1923) asserts that the intravenous injection of diphtheria antitoxin is not a dangerous method. It should be the method of choice, even in patients who have previously received serum. It is only necessary to give the injection slowly, and temporarily or definitely discontinue it on the appearance of any reaction on the patient's side. The most unfavorable attacks after reinjection occur at the time when the serum rash appears.

Serum Phenomena and Their Relationship to the Prognosis of Diphtheria.—G. W. Ronaldson (*British Journal of Children's Diseases,* July-September, 1923) states that increased doses of the serum increases the incidence of serum manifestations, but diphtheria toxin exercises an inhibitory influence both on the frequency and the intensity of serum reactions. In very severe cases the rash is late in development, scanty, or entirely absent. The presence of a rash, even of the most limited nature, is a favorable sign. A good rash suggests a good prognosis. A case with a well marked reaction is not likely to end fatally, and the appearance of a rash affords some assurance that severe paralysis is unlikely. A primary rash is valueless in forming an estimate as to the likelihood of paralyses generally, its value being restricted to the severer forms. A secondary rash enables one to forecast with confidence that a patient will neither die nor suffer from a paralysis of any of the graver types.

Diphtheria Carriers.—F. W. Sumner (*British Medical Journal,* May 12, 1923) states that prophylaxis is a two edged sword. In an outbreak of diphtheria, prophylactic injections must be given to all contacts, but where antitoxin only is used, a crop of diphtheria carriers should be watched for. In a series of tonsillectomies, thirty per cent. were found to harbor diphtheroid bacilli in the tonsils. A considerable percentage of the public at large are probably diphtheroid carriers. From a clinical point of view there are three types of sore throat: 1, those with clinical manifestations of a diphtheritic throat and with positive bacteriological reports; 2, those with clinical manifestations of a diphtheritic throat but with negative bacteriological reports; and 3, those without clinical manifestations of a diphtheritic throat and positive bacteriological reports. The first two groups must be regarded as diphtheria and treated accordingly. The cases in group three are possibly and probably merely cases of some inflammatory condition of the nasopharynx and the bacilli found are nonpathogenic and noncausative of the condition. Clinically some of these cases must be considered and treated as diphtheritic.

Changes in the Streptococci Flora of the Throat During Diphtheria.—Lloyd Arnold (*Journal of Laboratory and Clinical Medicine,* March, 1923) reports a marked increase in the number of hemolytic streptococci in the throats of patients during diphtheria, at which time the streptococci have a limiting pH concentration differing from that of the normal throat flora, accompanied by an overgrowth of the types fermenting lactose and salicin. The strains that produce the limiting hydrogen ion concentration between pH 4.3 and 4.5 are considered by most investigators as of bovine origin, or nonpathogenes, and those reaching the lesser hydrogen ion concentration limits, pH 5.0 to 5.5 of human or pathogenic origin. If this is true the streptoccocic flora of the human throat can under normal conditions be considered as nonpathogenic types and the flora of the diphtheria throats as human or pathogenic types.

Twenty-five Cases of Whooping Cough Treated by Injections of Ether.—Angelica Panayotatou (*British Journal of Children's Diseases,* July-September, 1923) had occasion to treat twenty-five cases of whooping cough which occurred in an orphanage. They showed the characteristic cough and among them ten presented a grave form, both as regards the frequency and intensity of the attacks and in the general depression of the system. The duration of the illness was twelve days from the beginning of treatment, the average duration being thirty to forty days. All of the cases were cured in twelve to fifteen days by injections of two c.c. of ether every second day. The rapid recovery in all these cases was all the more remarkable, as the patients were poor working class children of feeble constitution and poor organic resistance. The treatment by injections of ether was particularly valuable, as it succeeded in cutting short an epidemic in an institution where the ages of the inmates rendered them eminently susceptible to infection.

Bronchomoniliasis.—Th. Joekes and R. H. Simpson (*Lancet,* July 21, 1923) state that bronchomoniliasis occurs more frequently than is suspected. Clinically, the disease presents no distinct entity. It occurs mostly in climates that are both hot and moist. The Monilia group are related to the Oïdia. Outside the body they are found widely distributed, but especially on fruit and dead leaves and wood. In the sputum they appear as round or oval Gram positive, yeastlike bodies, sometimes showing a double contour. Not infrequently tiny white particles, representing masses of growth, may be visible to the naked eye. In man, direct infection from case to case may occur, but more commonly bronchomoniliasis results from the inhalation of contaminated particles. Pulmonary infection may also occur by spread from a cutaneous source. In primary infections of the respiratory tract, the mouth and pharynx usually escape, but secondary infection from this source may occur in debilitated persons. Mixed infections, especially with the tubercle bacillus, are not uncommon. Clinically, all grades of severity are met with. Physical examination reveals signs of bronchitis or, perhaps, bronchopneumonia. In the more severe cases wasting is marked, and may be accompanied by all the signs and symptoms usually associated with pulmonary tuberculosis. The diagnosis may be difficult, and it depends upon the repeated demonstration of the fungus in the sputum. The specimens must be collected in sterile vessels and washed repeatedly before cultivation. The patient should gargle with sterile saline solution or with a dilute solution of potassium permanganate before expectorating. The administration of potassium iodide in large doses is effective therapy, although the tincture of iodine is perhaps more effective.

Experimental Studies of the Nasopharyngeal Secretions From Influenza Patients.—Peter K. Olitsky and F. L. Gates (*Journal of Experimental Medicine,* April, 1923) vaccinated fourteen volunteers with bacillus pneumosintes, at five to eight day intervals, giving three graded doses of heat killed cultures. Three of the volunteers were given a fourth and larger dose. Blood specimens were taken before and after vaccination for comparative agglutination tests. Only mild local reactions of a transitary nature were noted, and the constitutional reactions, consisting of headache, depression and generalized muscular pains, were also mild and transitory. Following vaccination there was a transitory leucocytosis and the appearance of specific agglutinins in the blood.

Varicella, Vaccine, Immunity.—Gustav Morawetz (*Wiener klinische Wochenschrift,* June 29, 1922) draws the following conclusions from observations on a large amount of clinical material: 1. In order to achieve general immunity, the appearance of antivirulent substances are necessary, in addition to the tendency to protection of the cells of the skin tissue. 2. Not only the epidermal cells, but also the cellular interstitial tissue of the internal organs must, in the event of an infection, be able to reproduce antibodies, to the protective activity of which the virulicide power of the blood should be chiefly attributed. 3. The immunity of the mucous membranes does not seem to run parallel with that of the external layer of the skin, but seems to be mainly dependent upon the appearance of antivirulent substances in the circulation. 4. The act of overcoming a smallpox infection calls forth an increased protective capacity in the cells of the internal organs in contradistinction to vaccination. The immunity acquired by the variola, therefore, protects more securely and for a longer time than vaccination against a spontaneous smallpox infection, against which a rapid appearance of virulicide substances in the circulation and in the mucous membranes must result from a promptly developing protective capacity in the internal organs. In this way the skin immunity must be lost sooner (smallpox inoculation with local result but without a subsequent general disease, positive vaccination). 5. Under certain conditions, especially under the influence of smallpox infection of the mother probably, a transient passive immunization of the infant may result during the first few weeks of life from transference of the maternal protective substances.

Differential Diagnostic Observations on Variola Vera, Modified Smallpox in Unvaccinated Persons and Varicella.—Tièche (*Schweizerische medizinische Wochenschrift,* May 3, 1923) designates the modified form of smallpox occurring in vaccinated individuals as varioloid and the primary modified smallpox occurring epidemically since 1921 in Switzerland as variola modificata. The great benignity of the disease and the frequently slight exanthem is charactertistic, so that there is great difficulty in differentiating it from varicella. However, there is no doubt that this is true smallpox, a variety of variola vera. Subsequent inoculations in unvaccinated individuals were always positive, whereas the pustular contents in varicella always gave a negative cutaneous reaction and a negative Paul reaction. The absence of prodromal fever and remittance of the fever during the spread of the exanthem are characteristic for varicella. The author lays great stress upon the distribution of the exanthem; even in these modified forms of smallpox there is the uniform regular development of the greater part of the efflorescences, especially the affection of the face and of the extremities, with very little on the chest and abdomen. Other very characteristic features are the firmness and hardness of the efflorescences, which cannot be wiped away like the varicella vesicles. The rosette forms are not characteristic.

CLINICAL MEDICINE.

Cholesterol Content of Blood in Anemia, and Its Relation to Splenic Function.—William MacAdam and Cecilia Shiskin (*Quarterly Journal of Medicine,* April, 1923) found that after splenectomy in acholuric jaundice and doubtless also in splenic anemia there is a gradual but very considerable increase in the total cholesterol content of the plasma and a progressive improvement in the blood count. However, the increase in the lipoids appears not to be related to any change in the corpuscles themselves. In the cases studied the abnormal fragility in hemolytic jaundice persisted three months after splenectomy, although the icteric tint and the urobilinuria disappeared within ten days of operation. The evidence pointing to a considerable increase in the cholesterol of the blood plasma after splenectomy in hemolytic jaundice seems conclusive, but the relationship of this hypercholesterolemia to the cessation of splenic function is quite undefined.

Complement Fixation Reaction as Applied to Leprosy.—Paul A. Lewis and Joseph D. Aronson (*Journal of Experimental Medicine, August,* 1923) found that the sera from thirty-nine cases of leprosy gave complement fixation reactions with all of the antigens used, which consisted of bacillus lepræ (Clegg), (Duval), and (Kedrowsky), bacillus tuberculosis, alcohol extract; Petroff's antigen, and cholesterol and acetone insoluble antigens (Wassermann reagents). The number of reactions with the tubercle bacillus or its products was actually higher than with any of the cultures having leprosy as a source. The reaction is apparently nonspecific. The property of multiple fixation may sufficiently characterize the disease to be of diagnostic significance, although judgment must be reserved for the present on this point. The most characteristic fixation given by the leprosy sera is that with bacillus lepræ (Clegg), used as antigen, either in the form of a bacterial emulsion or of an alcoholic extract of the dried culture. Antibody absorption may be demonstrated in the acidfast group if the absorbing bacteria are removed by filtration. Otherwise the resulting fluid is strongly anticomplementary. Leper serum is not deprived of the complement fixing body when so treated with either bacillus tuberculosis or bacillus lepræ (Clegg).

Utilization of Carbohydrate by Rats Deprived of Vitamine B.—H. A. Mattill (*Journal of Biological Chemistry,* April, 1923) describes a simple apparatus by which, in conjunction with a Haldane apparatus for gas analysis, respiratory quotients can be determined on small animals in twenty to forty minutes. Such determinations were made on rats on rations with and without vitamine B, which were fed carbohydrate in the form of cane sugar or glucose. Evidently vitamine B is not related to the metabolism of carbohydrate, since the quotients rose in both groups of animals, slightly less than those deprived of the vitamine, due probably to delayed absorption. Basal quotients were alike in both groups, nonfasting quotients slightly lower in the animals deprived of vitamines, this reflecting their semifasting state.

Blood Picture of Uncomplicated Pellagra.—John G. Huck (*Bulletin of the Johns Hopkins Hospital,* May, 1923) quotes from the literature on the blood picture in pellagrins to show that it abounds in contradictions. He then describes the blood picture in ten cases of pellagra at the height of the illness, in twenty cases during convalescence, and in five during the course of pellagra. In most instances the hemoglobin showed a slight decrease, the red blood cells showed a slight reduction; the color index was normal in all but six cases, in which it was slightly low. The leucocytes were in normal limits except in one case where the patient had a cold. The differential count was the most striking feature of the blood picture; when the symptoms are severe there is an increase in the lymphoid elements. With the subsidence of symptoms and in the convalescent stage, there is an increase in the polymorphonuclear eosinophiles. Eosinophilia indicates a favorable prognosis. The platelet counts are normal.

Quantitative Studies With Arsphenamine.—A. C. Kolls and J. B. Youmans (*Bulletin of the Johns Hopkins Hospital,* May, 1923) used the diazoreaction of Abelin, which was found to yield trustworthy results with arsphenamine containing blood specimens obtained either by the addition of the drug *in vitro,* or by drawing blood from animals or from man after intravenous injection. The method is also applicable to tissues, spinal fluid, and urine. An experiment is described in which a dog received disodium arsphenamine in doses of twenty mgm. to the kilo. The distribution and concentration of arsphenamine in the blood, spinal fluid, bladder urine, spleen, liver, lung, heart, kidney, pancreas, intestine, muscle and brain were determined by the method described. Old solutions gave reactions with very little less intensity than fresh arsphenamine. It was shown that oxyaminophenylarsenoxide gave the test as readily as the mother substance. This compound has long been reputed to be the first oxidation product.

Variations in the Threshold in Renal Glycosuria.—George Graham (*Quarterly Journal of Medicine,* April, 1923) describes four cases of renal glycosuria which apparently are links between frank renal glycosuria cases and normal individuals. No sugar is detectable in the urine when the patient fasts for a short while, but when carbohydrates are eaten, sugar is excreted in the urine. The sugar tolerance (the height to which the level of the blood sugar rises after a dose of sugar) is normal.

Metabolic Studies in Four Cases of Addison's Disease.—Kensuke Gyotoku and Mune Momose (*Mitteilungen aus der medizinischen Fakultät zu Tokyo,* Band XXX Heft 1) never found distinct hypoglycemia in spite of repeated examinations. Although the blood sugar content in one of two lethal cases showed a gradual reduction in connection with the aggravation of the general condition, it nevertheless remained absolutely normal in another case until shortly before death. Adrenalin is effective in patients with Addison's disease as well as in healthy persons. The authors found just as marked an alimentary hyperglycemia in cases of Addison's disease as in healthy individuals, consequently the assimilation capacity for carbohydrate in this disease is not particularly increased, as is generally assumed. In two investigations, the nitrogen balance in severe cases was negative, whereas in two other light cases it was positive. It is noteworthy that the balance for calcium was negative and positive for phosphorus in all of the cases, whereas the finding for magnesium were uncertain. In one case sodium chloride was distinctly increased, but in the other cases there was less administered than was excreted.

Conditions Determining the Transplantability of Tissues in the Brain.—James B. Murphy and Ernest Sturm (*Journal of Experimental Medicine,* August, 1923) found that when a mouse tumor graft (sarcoma) was implanted entirely in the brain substance of rats, it grew almost invariably with great rapidity. In practically every instance in which the implant failed to grow, examination showed it had come in contact with the ventricle. Of fifty rats receiving a graft of mouse sarcoma and an autograft of spleen, in only eight tumors developed, and practically without exception these were small. On the other hand, sixteen of twenty-one rats receiving tumor and homologous spleen graft sizable tumors developed. Immunized rats inoculated into the brain with homologous spleen and tumor grafts have considerable resistance, while immunized mice inoculated with tumor alone are almost completely lacking in a defensive reaction to tumor growth. Although the brain is without obvious power of resistance to implants of transplantable heteroplastic mouse tumors, yet grafts of spontaneous tumors fail to grow there even, as a rule, when tumor implanted and animal are of the same species.

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OBSTETRICS.

Postpartum Hemorrhage.—J. A. Kinnear (*Canadian Journal of Medicine and Surgery*, February, 1923) says that the prophylactic treatment is the most important. Postpartum hemorrhage is usually preventable. In its severe forms it seldom occurs in the practice of careful men. The patient should not be allowed to linger in labor until she is exhausted. Do not express the placenta until it is separated from the uterus, unless she is bleeding. Do not give any more anesthetic than necessary. This does not mean that we should forget the humanitarian side of our work and allow our patients to suffer unnecessarily, but that we should not permit familiarity with anesthetics to breed carelessness. Pituitary extract is a valuable remedy when properly used, but a most dangerous one when improperly used. After using much anesthetic, or giving pituitary extract, if the uterus has been overdistended with hydramnios or twins, ergot should be given hypodermically. If the placenta is still *in utero*, get the uterus to contract by massage and express the placenta by Credé's method. If you cannot express it, remove it manually. Then, with the closed fist in the uterus, and the other hand massaging the uterus, it will contract down on your hand and bleeding cease.

Relationship of Eclampsia to Other Toxemias of Pregnancy.—Gibbon FitzGibbon (*Irish Journal of Medical Science*, August, 1922) gives the following as the regular treatment of a toxemic patient in the Rotunda Hospital, Dublin: The patient is kept in bed. A full dose of purgative is given. If the bowels have not acted for some time enemata are given and repeated. If there is vomiting, enemata are continued, and at the end of twenty-four hours a purgative is invariably retained. Purgation is maintained. The patient is induced to drink as much water as possible, at least six pints, but preferably more, in the twenty-four hours. This treatment is continued until the symptoms have enormously abated, and the secretion of urine at least up to normal, with a moderate amount of albumin. The patient is then tried on a half pint of milk, and gradually brought up to a low diet, without meat. If she stands this she is allowed to go home, and attends the dispensary, with strict injunctions about diet; and is told to take a purgative every day to produce at least two movements. In a number of these cases the patients are near term and come into labor, of the others some carry on to term, and deliver themselves without further trouble. Some of the patients return with a renewal of marked symptoms. If the patient does not respond to treatment sufficiently to be tried on diet, or relapses as the result of diet, or if at any time the fetus is found to be dead, labor is induced.

Simultaneous, Combined Use of Mercuric Chloride and Arsphenamine in Puerperal Sepsis.—Hans Kiehne (*Zentralblatt für Gynäkologie*, March 17, 1923) states that the combined mercuric chloride and arsphenamine injections gave good results in puerperal sepsis and better results than such colloidal silver preparations as collargol. He considers this form of treatment, just like every other form, as unsuitable in pronounced peritonitis and in those cases that are subjected to treatment too late and where the patient's powers of resistance are exhausted. Furtheremore, this form of treatment will frequently fail so long as placental remains are left behind in the uterus. Therefore the conclusion is drawn that these remains should always be removed wherever possible. The author dissolves 0.3 grams of neoarsphenamine in five or six c. c. of tap water and adds two c. c. of a one per cent. solution of mercuric chloride and this mixture is injected intravenously. A second injection may be given after two or three days. As many as five injections may have to be given at progressively longer intervals.

Forceps Procedure With the New Kielland Obstetrical Forceps.—E. Frey (*Schweizerische medizinishe Wochenschrift*, March 29, 1923) mentions the advantages of the Kielland forceps for the general practitioner, as follows: 1. It can be applied in the biparietal diameter. 2. It can be applied effectively to the head in both the high and low transverse position of the head in the pelvis. 3. Thanks to the sliding lock an accurate adaptation of the forceps to the head is possible and a slipping of the forceps is prevented. 4. As a result, there is no danger of compressing the fifth lumbar nerve and no resulting traumatic neuritis in the peroneal region during the puerperium. On the strength of these advantages, the Kielland forceps is recommended to the general practitioner under the classical indications, which are as follows: 1. The forceps operation is indicated only in conditions threatening to the mother or child, in so far as the simple Cristeller procedure is futile. 2. The following prerequisite conditions must be fulfilled: a, the child must be alive and viable; b, the cervix must be completely dilated; c, the head must have passed the pelvic inlet with its greatest periphery; d, the promontory must be no longer palpable; e, there must be no marked deflexion as long as the head is still in the pelvic cavity; and f, the pelvic outlet must not be constricted.

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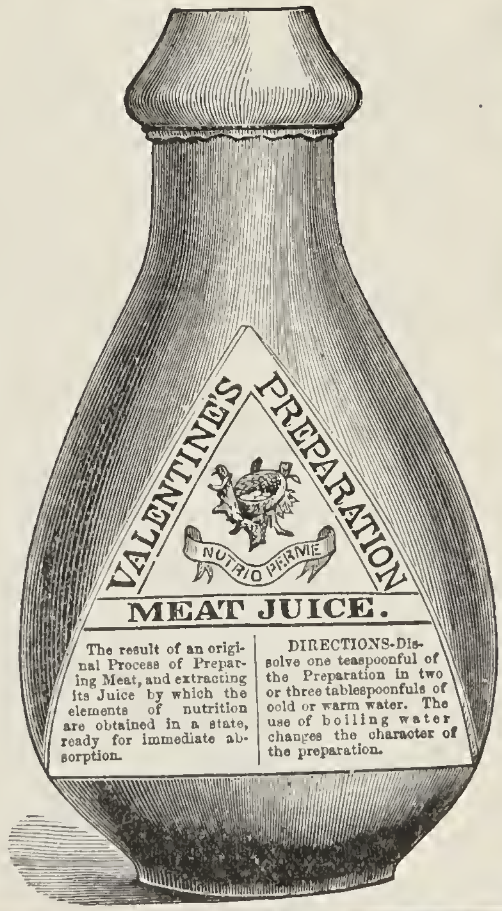
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MISCELLANY.

Management of Early Cases of Chronic Infectious Arthritis.—Russell L. Cecil (*Medical Clinics of North America*, November, 1922) states that every case of arthritis requires individualization in treatment. An accurate history is most important in determining the etiology, and the history should include the inquiry concerning attacks of tonsillitis, alveolar abscesses, sore throat, colds, genitourinary diseases, diseases of the gastrointestinal tract, colitis, gallstones and appendicitis. The oral cavity and the extremities must be examined with particular care. Cultures should be made from the prostatic secretion. We must determine whether the joint itself or the surrounding muscles and tendons are involved, whether the inflammation is periarticular, osseous or cartilaginous, also the degree of ankylosis, and whether it is fibrous or bony. The laboratory tests should include a Wassermann reaction and the amount of blood, sugar and uric acid in the blood. The röntgenogram indicates the extent of the lesion and the prognosis. Cultures should be taken from all possible foci of infection.

The treatment depends upon whether the condition is one of active infection or one in which the infection has already been overcome and is followed by secondary fibrous changes. In active cases all possible sources of infection should be eradicated. Heat, in the form of hot baths, baking, electric pads, sun baths, etc., is most important. Massage must be used with great caution in active cases. A low carbohydrate diet is important. The bowels should be kept active with laxatives if necessary and high colonic irrigations are valuable in the gastrointestinal cases. Salicylates are used occasionally, but potassium iodide or hydriodic acid is used more frequently. In the postinfectious stage foci of infection should be removed and heat and active and passive exercises are important. Arthritis is a selflimiting disease, and many cases recover without any treatment.

Researches on Yellow Fever. Comparative Etiological, Pathological, and Epidemiological Considerations; Prevention and Treatment.—Hideyo Noguchi (*Lancet*, June 17, 1922) states that the morphological features of the Leptospira icteroides are almost indistinguishable from those of Leptospira icterohemorrhagiæ or Leptospira hebdomadis and other nonpathogenic varieties of leptospira, but yet the pathogenic varieties are by no means identical. The icteroides is predominantly icteronephritic, with a marked tendency to produce fatty degeneration of the parenchymatous cells of the liver and kidney; the hemorrhage into the mucous membranes is more marked in experimental infections than in the experimental infectious jaundice. In the hebdomadis infection there is only a slight tendency to jaundice or none at all; in the human disease, also, the differences are chiefly of degree. While a typical case of yellow fever is not readily confused with typical infectious jaundice, there are many borderline cases in which only epidemiological differences can decide the diagnosis. Infectious jaundice usually shows a slight leucocytosis, whereas in yellow fever the leucocytes are but slightly increased, the differential counts in the two diseases being similar. The two diseases are produced by two distinct but closely related species of leptospira, just as yaws, syphilis, and rabbit venereal disease are three different diseases caused by three morphologically indistinguishable but distinct species of treponema.

The fatty degeneration of the liver and kidney in human yellow fever and in experimental animals show that the Leptospira icteroides is the cause of yellow fever. Animals inoculated with unbroken series of passages of the Leptospira icteroides show less jaundice, the liver is less fatty, the kidneys and other tissues are more hemorrhagic and death occurs from leptospiremia. The picture in such animals is different from that found in animals inoculated with a strain freshly isolated from human cases or one passed through a few generations on the leptospira medium of the mosquito. If yellow fever was transmitted directly from man to man without an intermediary host in an unbroken series, the clinical picture might be different. Guineapigs, puppies and marmosets are inoculated only with difficulty, and practically they are never sources of danger to the community.

Wherever an antistegomyia campaign is unavailable, or when a case of yellow fever has occurred in a community, the use of immune serum is indicated. If given in the incubation period the serum prevents the development of infection. Vaccinated persons are perhaps as susceptible as the unvaccinated during the first ten or fifteen days following the last injection; after that time the protection becomes effective. Early treatment reduced the mortality from fifty-two per cent. to thirteen per cent., and it also alleviates the subjective and objective symptoms.

The Blood Transfusion Method in the Prevention of Quinine Intoxication.—E. Keramopoulos (*Presse médicale*, June 24, 1922) comments on the relative inefficacy of quinine substances, and reports the case of a female malaria patient of thirty-seven years in whom oral or intramuscular administration of quinine always caused dyspnea, faintness, tachycardia and urticaria. Substitution of intravenous injections of novarsenobenzol and collargol for the quinine resulted in similar untoward symptoms, except that urticaria was absent. Besredka's method of specific tachyphylaxis by repeated injections of small amounts of quinine, as well as nonspecific prophylaxis with sodium carbonate, were next tried, but without success. A series of blood transfusions was then begun. Every two or three days twenty mils of blood was collected aseptically from the bend of the elbow of the patient's daughter in a syringe containing two mils of four per cent. sodium citrate solution, and immediately injected into the patient's vein. Merely a slight febrile reaction followed these injections on some occasions, but soon the patient's blood and body weight began to show distinct improvement, and furthermore, when a 0.1 gram tablet of quinine hydrochloride was administered, it was well tolerated. Later, the patient daily, for a considerable time, took one gram of quinine divided into two doses, without exhibiting the least sign of intolerance. The relief from quinine intoxication in this case is definitely ascribed by the author to the treatment by repeated blood transfusions.

Constipation in Young Girls and Women—

especially those who spend much time indoors engaged in sedentary pursuits—is almost invariably attended by a retention of waste and toxic substances. Sooner or later these make their way from the bowel into the general system and give rise to a host of autotoxic ills.

Correction of this condition is imperative, and, the safest, simplest and most effective remedy for the purpose is

INTEROL

a pure mineral oil of the proper density and viscosity to assure satisfactory lubrication of the intestinal canal, and thus relieve and correct bowel inactivity without the usual disagreeable effects of cathartics as commonly employed.

Besides lubricating the canal, INTEROL renders the feces soft and plastic, thereby promoting their easy passage and evacuation with gratifying freedom from discomfort and distress.

It would indeed be difficult to suggest any more serviceable and agreeable medium for the correction of constipation, with its attending autotoxemic conditions, than INTEROL.

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ADACCO SALT—Effervescent Saline Laxative and Uric Acid Solvent.
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Directions:

To relieve the constipation of young girls and women, give two to four teaspoonfuls of INTEROL morning and night, increasing or decreasing the quantity as conditions require. As the bowels yield to the action of INTEROL, gradually cut down the dose to the least amount that—taken at bedtime—will assure a daily evacuation.

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Glucose and Blood Transfusion.—Dupuy de Frenelle (*Bulletin médical*, April 14, 1923) finds blood grouping unnecessary where blood to be transfused is diluted with glucose and commends this procedure to the practitioner in cases where the otherwise necessary and time consuming precautions cannot be taken. An intravenous injection of either a 4.7 or ten per cent. solution of chemically pure glucose at a temperature of 38° C. is slowly given from a suitable receptacle, and during the process the elbow of the donor is held above the receptacle, a vein punctured, and two hundred grams of his blood allowed to flow into the solution. This amount of blood can be given in from five hundred to one thousand cubic centimetres of the glucose solution without blood grouping. Tests showed that the 4.7 per cent. solution kept the blood from clotting for half an hour and the ten per cent. solution for over an hour, when one part of blood was mixed with four parts of glucose solution. Fifteen patients were saved by this procedure who, it is believed, would have succumbed had the usual blood grouping been resorted to.

Rapid Closure of Incisions With the Loop Stitch.—C. Lasserre (*Journal de médecine de Bordeaux*, April 10, 1923) folds six to ten pieces of suture material at their middle, wraps the ends in a piece of gauze so that merely the loops project, and holds the gauze in the left hand. With the right hand a Reverdin needle is passed through the margins of the wound at suitable intervals, each time drawing back a loop of suture material with it. When a sufficient number of loops has been inserted, the needle and excess of suture material are laid aside, and one end of each suture passed through the corresponding loop. Upon pulling on both ends of the suture, the wound margins are automatically drawn in exact apposition and the suture is tied with a plain knot. The procedure gives precise coaptation without loss of time and permits the use of a loop stitch without assistance from another person.

Pollen and Hay Fever. A Regional Problem.—W. V. Mullin (*Colorado Medicine*, April, 1923) thus summarizes his paper: 1. Hay fever is caused almost exclusively by plants whose pollen is sufficiently light and abundant to be distributed widely through the air. 2. Many of these plants are limited to certain sections of the country, or are unevenly distributed, and in consequence, the etiology of hay fever becomes largely a regional problem. 3. Much of the failure in pollen extract therapy is due to an insufficient knowledge of the botany of plants with wind borne pollen. 4. If the best results are to be obtained, a survey of such plants should be made by competent authorities for each locality, to determine the species present, their relative abundance and pollinating time. 5. The individual case should be treated with a full knowledge of the significant plant life in the region in which his hay fever develops. 6. Diagnosis is simplified by a thorough study of the history of each case in connection with an adequate local pollen survey, including the use of pollen plates. 7. Treatment with pollens gathered in the region in which the attacks occur is always advisable and often essential. 8. Treatment during attacks presents many difficulties, but promises increasingly good results.

Capillary Microscopical Investigations.—G. Linzenmeier (*Zentralblatt für Gynäkologie*, June 24, 1922) does not believe in the theory that angiospasms are the sole cause of capillary stasis. As this stasis is frequently found in eclampsia, he investigated the pathogenesis of eclampsia and the question whether the stasis observed in eclampsia resulted from it and also the phenomena of the expression of a vascular spasm. He repeatedly observed that the stases in adjacent capillaries occur independently of one another, occurring preferably in thin capillaries, which finding contradicts the Hinselmann theory that the stases are due to obstruction of the arterial supply of the capillary coils. This theory is also contradicted by the fact that the blood pressure in febrile and septic conditions, in which stasis occurs more often than in pregnancy and eclampsia, is always diminished and the vasomotor system is frequently paralyzed; spasms often occur, however.

It has been shown that the granular appearance of the blood stream is due to agglutination of the erythrocytes, which phenomenon occurs in every case where a rapid sedimentation of the erythrocytes occurs as soon as the rapidity of the circulation is diminished. The author's experiments showed a striking parallelism between the rapidity of the sedimentation of the erythrocytes and the picture observed in the capillary circulation. Persons who show a slow sinking rate also show many stases, and those showing rapid sedimentation of the erythrocytes also show a granular circulation and proportionately many stases. There is undoubtedly a relationship between the instability of the suspension of the erythrocytes and the changed capillary circulation. Another factor favoring the clumping of the erythrocytes is the slowing of the current in the capillaries and here the increase and the marked lowering of the blood pressure act identically; a rise of blood pressure results from the resistance in the peripheral vessels; the diameter of the lumen of the vessel affected is diminished and the blood supply is therefore lessened and a slowing up of the capillary circulation results. In both eclampsia and in septic diseases the capillary circulation is slowed from various causes and this, as a result of the existing increased rapidity of sedimentation of the erythrocytes, favors the clumping of the erythrocytes and with it the formation of stases.

Salivary Glands in Carcinoma.—L. S. Dudgeon and Philip H. Mitchiner (*Lancet*, September 9, 1922) find that in the vast majority of cases of carcinoma of the tongue and floor of the mouth, the salivary glands are not the seat of carcinoma. In nearly every case the changes present in these glands are of a chronic inflammatory nature, somewhat analogous to the changes observed in the pancreas in chronic pancreatitis and apparently due to infection from the mouth along the ducts; other cases show no microscopic changes. The lymph nodes in this area show malignant changes in only 27.3 per cent. of early and fifty per cent. of late cases, though inflammation is always present. It would appear, therefore, in certain cases with early carcinoma of the tongue, to be justifiable to leave the submaxillary area untouched at the operation, although clinical experience teaches that the risk of the subsequent appearance of metastases is very great.

Convalescence

following the acute infections, such as **influenza, pneumonia, bronchitis, diphtheria, scarlet fever and measles, as well as after surgical operations, child birth,** and so on, is rapidly promoted and hastened by the systematic use of

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Dysmenorrhea

is one of the most common and intractable affections that tax the skill of the practitioner. Fortunately, in

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the practicing physician has a remedy that, owing its beneficial action to its regulation of the utero-ovarian circulation, promptly reduces the local congestion and thus effects an early relief from pain. Not the least, therefore, of the notable advantages of Hyperol, is the way it obviates, in the great majority of cases, any necessity for opiates or narcotic drugs, with their all too evident dangers.

But it is through its restoration of normal functions of the uterus and ovaries that Hyperol accomplishes its greatest benefits, for it thus enables medical men to produce results in **amenorrhea, dysmenorrhea, subinvolution and kindred** ills that are possible with few other remedies.

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In **Typhoid, Gastric** and **Other Fevers,** where it is **Essential** to **Sustain** the **Patient** without **Irritating** the **Weakened Digestive Organs, Valentine's Meat-Juice** demonstrates its **Ease** of **Assimilation** and **Power** of **Restoring** and **Strengthening** when **Other Food Fails.**

J. R. Wood, M. D., *Physician Sheltering Arms Hospital, Paint Creek, W. Va., U. S. A.:* "I have been using VALENTINE'S MEAT-JUICE in the treatment of Typhoid Fever cases in the Sheltering Arms Hospital, for the last two or three weeks, with the most gratifying results both to the patient and physician. I consider it the best preparation of animal food I have ever seen, in fact, the only one I have ever had any success with."

Dr. Genevaix, *Assistant Surgeon-Major, First Class, Hotel Dieu, Creusot, France:* "The patients to whom I have given the excellent preparation, VALENTINE'S MEAT-JUICE, have found their general condition rapidly improved by it, and in the convalescence from continued Fever (Typhoid and Para-Typhoid) it gives the best results."

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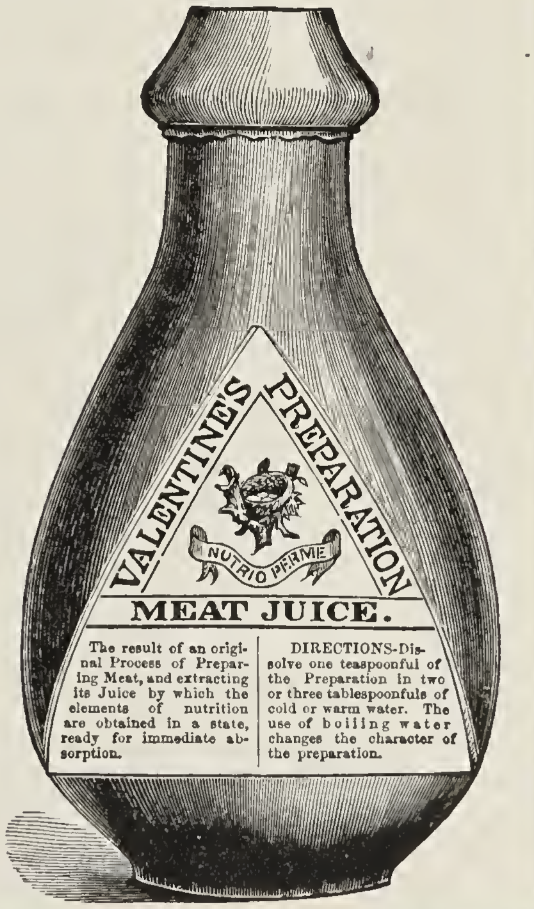

The result of an original Process of Preparing Meat, and extracting its Juice by which the elements of nutrition are obtained in a state, ready for immediate absorption.

DIRECTIONS-Dissolve one teaspoonful of the Preparation in two or three tablespoonfuls of cold or warm water. The use of boiling water changes the character of the preparation.

MISCELLANY.

The Cancer Patient.—Ernest Frederick (*Canadian Practitioner*, January, 1923) advises the insistence upon a gradual increase of muscular activity. Forbid the constant use of the motor car, encourage golf, walking, gardening, woodchopping, or calisthenics. If the patient is unable to do these things, urge the use of "resistance exercises, in which the patient, while lying or sitting still, contracts vigorously a set of flexors resisting their action by a simultaneous contraction of their opposing extensors." Thus the use of all the muscles in the body can be brought about. This is the main idea in a "system" well advertised and sold for a hundred dollars. Another necessity is to cut down and alter the diet, not as a temporary measure, but as a continuous habit of life. He urges the following intensive diet: Three pints of vegetable juice daily, one and a half pints of fruit juice daily, raw vegetables and fruits *ad libitum*, ground or scraped if necessary to make them digestible, and so mixed as to make them palatable, stewed and cooked vegetables and fruits, sugars, starches and syrups, cereals, bread and cakes, pies and jellies enough to fill out the day's need. Forbid proteids. Psychical and physical benefit results from taking a mild cathartic and diuretic for months. Thyroid glands and arsenic have proved of value, the former probably by stimulating general metabolism, the latter by preventing overrapid breaking down of the nitrogen from the protein molecules.

The Theory of the Stimulation of Turning on the Semicircular Canals. — Fritz Rohrer (*Schweizer medizinische Wochenschrift*, July 6, 1922) conducted systematic experiments on guineapigs and on models which resembled the mechanical relationships of the semicircular canals, in which the resultant nystagmus was observed after varying the direction, rapidity and time of turning. He found: 1. That the duration of the resultant nystagmus increases with the rapidity, beginning at a certain threshold value (in the guineapig) of three to four seconds, at first rapidly and then more slowly. The optimal duration of turning is independent of the rapidity. Turning toward the left results in a longer duration of the nystagmus than does turning to the right, this being the result of a deeper position of the threshold turning rapidly than when the turning is toward the left; the same relationship holds in regard to the number of oscillations of the subsequent nystagmus. 2. Variations in the length of the turning radius of 1.4 to 27.4 cm. produced no increase, but a slight decrease of the reflex phenomena produced by the labyrinth, and therefore a synergism of the fleeting powers is unlikely as a result of stimulating the semicircular canals. 3. Turning experiments on models mechanically resembling the semicircular canals show a similar dependence of the duration of the subsequent nystagmus, produced by rotatory tardiness upon the variable factors of the turning procedure; it is therefore likely that the cause of this variation in the semicircular canals must be sought in the peripheral end organs and not in the relationships of the central apparatus. 4. Proceeding from the theory of the current processes and the theory of the elastic swayings, the mechanical processes in the semicircular canals in relation to the turning process may be treated according to a fixed formula.

Periodical Alkalemia with Alkalosis in the Adult.—With the aid of investigations on the blood and alveolar air, William MacAdam and John Gordon (*Lancet*, September 9, 1922) show that during the attacks of sickness there is a low hydrogen ion concentration of the blood, a low carbon dioxide tension of the alveolar air, and a high carbon dioxide combining power of the blood plasma—a condition of alkalemia with alkalosis. The treatment with large doses of tenth normal hydrochloric acid produced satisfactory results; the administration of ammonium chloride was unsuccessful, owing to the induction of vomiting. A clinical association of acetonuria with a condition of alkalemia was thus demonstrated. These findings may afford an explanation of some of the unsatisfactory results following the administration of large doses of alkalies in certain conditions of acetonemia, while some of those metabolic disturbances (certain types of toxemia of pregnancy), in which a low ammonium index is associated with severe clinical symptoms may be due to the swing of the acid base balance of the blood to the alkaline side.

Anaphylaxis Among Bacteria.—F. Arloing and L. Thévenot (*Paris médical*, June 24, 1922), recalling Richet's investigations on habituation and anaphylaxis as displayed in the lactic ferment, tested in Bacillus diphtheriæ, Bacillus pyocyaneus, Bacillus subtilis, and Bacillus prodigiosus the anaphylactic effects produced by a sudden change in the amount of serum added to their cultures. The organisms were first sensitized by culture for five days in ordinary bouillon to which were added in different series of tests, four, forty, or eighty per thousand of normal horse serum. The anaphylactic shock was then induced by transferring the germs directly for eighteen hours into bouillon with two hundred per thousand of serum. The effects of the shock were verified in plain bouillon and agar. The general biologic characteristics of the organisms were found to have been altered by the procedure. The culture films and pigmentation were strikingly changed and the virulence of the diphtheria bacillus was reduced. The morphological features and staining properties were, however, not influenced. The changes observed are regarded as manifestations of anaphylaxis in the bacteria referred to.

A New Hydrostatic Bag for the Induction of Labor.—G. H. Lee (*American Journal of Obstetrics and Gynecology*, June, 1922) describes a bag designed to combine the advantages of the Barnes, Voorhees, and Champetier de Ribes bags while eliminating their objectionable features. It comprises a globular portion intended to rest in the vagina just outside the cervix, a constricted portion which fits in the cervical canal and when distended dilates the cervix, and an enlarged, conical portion which is placed in the lower uterine zone and supplies an efficient foreign body to excite uterine contraction. Nothing protrudes from the vagina except the attached rubber tube, which is one centimetre in diameter. The bag is made of fairly heavy soft rubber, and can be folded within the grasp of a uterine dressing forceps so that it will pass through a cervix admitting the index finger. In appropriate cases a weight can be attached to the rubber tube.

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Every physician knows the importance of breast-feeding as a safeguard in the prevention of gastro-intestinal disturbances.

This information should be convincingly brought to the attention of every mother.

The physician also knows that where breast milk is not available—a properly modified, clean, nutritious substitute should be selected.

For the average normal baby, Eagle Brand milk (which is made from pure, fresh, full-cream cows' milk) is a clean, nutritious food.

This product, because it is clean and easily digested, has been used with good results in gastro-intestinal disturbances. No milk-borne epidemics have ever been traceable to Eagle Brand milk.

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Pneumaturia.—Hermann Walthard (*Schweizerische medizinische Wochenschrift,* August 17, 1922) finds that laboratory investigations unquestionably show that the gas formation must be attributed to the bacterial decomposition of albuminous substances. The formation of the gas depends, not upon the amount of the albumin present, but apparently, more on the qualitative changes of the albumin. It is also possible that with the onset of convalescence, the albuminous substances, which at the fastigium of the disease at the time of the pneumaturia are excreted in the bladder unoxidized, are again retained in the body and decomposed in the bladder by the bacterial splitting and gas formation. A considerable amount of gas may be expelled even though the Esbach test shows no more than one fortieth of one per cent. of albumin present. The gas formation depends upon the nutrition and the digestion of the patient. The bacterial activity depends upon the action of the disinfections introduced by the mouth and the urethra, the urinary reaction, the changes in the urinary colloids and on the patient's resistance; other factors are the viability of the gas producing germs, their injury from autogenous metabolic products, and the variations of the gas forming capacity in the various bacterial generations. The prognosis in regard to life is not bad in pneumaturia arising from urine containing sugar or albumin. The decisive factor is the basic disease, of which the pneumaturia is after all only a symptom, namely cystitis, of which the causes and secondary condition are urinary retention in urethral stricture and prostatic hypertrophy, obstipation, diabetes, nephritis, appendicitis, adnexal diseases, etc. Alkalinization of the urine is useless and only an antidiabetic diet has been successful in eliminating the gas through the disappearance of the sugar; in those cases without sugar, even the antidiabetic diet failed. Autovaccines and salvarsan preparations may be useful.

Thermotherapy.—B. S. Price (*American Journal of Electrotherapeutics and Radiology,* January, 1922) summarizes as follows:

1. The unnecessary confusion existing with regard to the recognized distinguishing features and indications of the different forms of thermotherapy should be corrected as much unnecessary harm results from it. At the same time many lives are being destroyed through the lack of fulfilment of the possibilities.

2. Careless nomenclature used in the expression of the various forms of thermotherapy indicates its haphazard use and in the minds of many a confused and unrecognized conception of the distinguishing features. Heat brings about opposite results under different conditions, therefore definition is necessary. Human bakes do not exist in civilized communities.

3. The present degree of knowledge with regard to thermotherapy largely limits its application in therapeutics to the effects produced from the accompanying qualities of the modality rather than from the production of heat within the tissues except in the case of diathermy. Heat obtained from such active sources as radiation and electrical currents is accompanied in its effects by those of molecular massage and under high temperature, the initial stimulation more rapidly passes into depression than in the case of convective heat of high degree.

4. The different forms of thermotherapy, largely dependent upon their associated features, fill wholly different indications. Further, the results obtained vary widely even to the degree of antagonism dependent upon sudden exposure to high temperature or prolonged exposure to a low temperature and upon the mental and physical condition under which the patient is placed.

5. The significance of catabolic elimination requires more conscientious study than is generally recognized.

6. The oven bath properly given is a cellular waste eliminant and as such fills an entirely different indication from any other form of heat. It would seem to act mainly through the adrenosympathetic system. Oven bath stimulation is distinctly chemical in its last analysis of elimination and in no sense one of perspiration. Whereas other forms of heat may have a more marked influence upon metabolism under certain conditions, never do they markedly influence elimination. The oven bath is indicated wherever there is subelimination of toxic matters from the tissues, whether in the course of protein metabolism, as in nephritis, certain types of neuritis, rheumatism, etc., or in acidosis or other toxic conditions. It is also a valuable circulatory stimulant in these cases.

7. Cardiac incompetency is not a contraindication to the oven bath properly given.

8. In the use of superheated dry air as with other methods of modifying the circulation, it is important to maintain the circulatory changes thus produced until restored by Nature. Hence, the horizontal position is essential, and air cooling, as well as water cooling under improper temperatures must be avoided. Air cooling is impossible of regulation. Water regulation is possible.

9. The state of abeyance under which the cardiovascular control is placed for a few hours as a result of the oven bath is followed by marked improvement in its tone over that preceding the treatment. This is evidenced in functional hypotension cases.

10. There is necessity for discrimination and proper combination of measures in this as in all forms of therapy.

Treatment of Herpes Zoster.—Poirot-Delpech (*Paris médical,* March 10, 1923) recommends the local application of a solution of picric acid crystals, five grams, in ether and alcohol, of each fifty grams. The solution should on no account be brought near an open flame, and dressings should not be burned. The lesions are lightly treated with the solution on alternate days and a layer of cotton then applied. Internally, one or two grams of antipyrine a day are given, according to the severity of the pain. Under this treatment six out of eight patients recovered in three to six days, the other two requiring nine and twelve days, respectively.

Galvanopalpation and X Rays.—Max Kahane (*Wiener klinische Wochenschrift,* August 17 and 24, 1922) compares the results of the two methods of examination. Galvanopalpation serves to supplement the x ray findings. In diseases of the skin and the muscles, for example, the galvanopalpation has the advantage over röntgenography, whereas diseases of the bones belong to the domain of röntgen diagnosis. In the examination of other organs both methods of examination should be combined.

Convalescence

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In **Gastric** and **Intestinal Troubles,** in **Febrile Conditions,** in **Wasting** and **Debilitating Diseases** and before and after **Surgical Operations** when the **Stomach** is **Rejecting Food** and it is **Essential** to **Conserve** the **Vital Forces, Valentine's Meat-Juice** demonstrates its **Ease** of **Assimilation** and **Power** to **Restore** and **Strengthen.**

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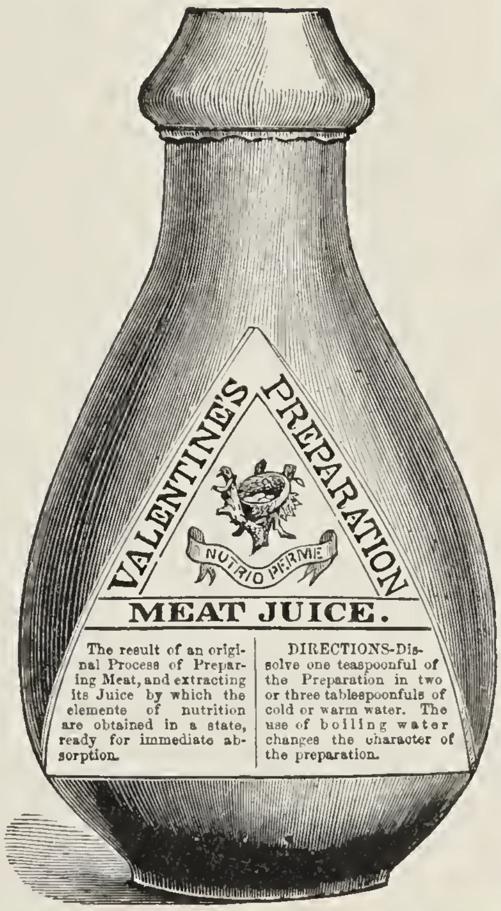

The result of an original Process of Preparing Meat, and extracting its Juice by which the elements of nutrition are obtained in a state, ready for immediate absorption.

DIRECTIONS-Dissolve one teaspoonful of the Preparation in two or three tablespoonfuls of cold or warm water. The use of boiling water changes the character of the preparation.

MISCELLANY.

Röntgen Ray Therapy of Tuberculosis of the Skin.—Richard Volk (*Wiener klinische Wochenschrift*, January 18, 1923) believes that röntgentherapy is dispensable in tuberculids. In erythema nodosum the results are good; they are just as good in the verrucous and ulcerated forms of lupus vulgaris. Moderate doses are preferable in these cases. Residual nodules should be extirpated with Finsen or Kromayer irradiation. Lupus of the mucous membranes, particularly lupus of the nose and lips, also react well to röntgenotherapy, but lupus of the larynx does not react so well. The torpid form of lupus erythematodes is also suitable for röntgentherapy, especially in chronic cases, even though the therapeutic results are determined with difficulty. The effects from röntgentherapy of lupus cannot be increased with injections of eosin or iodin. On the other hand, Volk is in favor of the preliminary treatment with strong pyrogallol salves and also with Unna's pepsin salve with only three to five per cent. pyrogallol (reduction of the toxicity). Röntgentherapy should be instituted as long as the lupus has not as yet ulcerated. It is possible that the danger of lupus carcinoma is somewhat greater after röntgentherapy than otherwise, but this may always be attributed to improper doses.

Variations of Vagosympathetic Tone in Serum Disease and Infectious Disorders.—Tinel, Santenoise and Laurent (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris,* March 29, 1923) depend on the oculocardiac reflex as the criterion of vagosympathetic balance in any given case. They enunciate the general law that hypervagotonia promotes rapid, violent and serious anaphylactic or anaphylactoid reactions as well as selective nervous intoxications, whereas hypovagotonia or sympatheticotonia afford the conditions most unfavorable to such effects and bring about a nonsusceptibility to them. Variations in both anaphylactic reactions and toxic or drug effects at different times are thus explainable on the basis of variations in the preëxisting neurovegetative balance. Anaphylactic shock is itself, however, a most powerful modifier of vagosympathetic balance, at first leading to a sudden, brief accentuation of the preëxisting state, then a more or less complete and lasting reversal of conditions. Thus, in a vagotonic subject any sort of anaphylactic shock soon leads to a sympatheticotonic state in the presence of which no further shock can occur. Most of the nonspecific antianaphylactic procedures appear to act in this way. On the other hand, in a sympatheticotonic subject there may appear secondarily a state of vagotonia during which the individual becomes susceptible either to a fresh shock or to persistent action of the injected material. This accounts, no doubt, for the appearance in sympatheticotonics of unexpected, always delayed and attenuated, reactions. Subcutaneous injection of horse serum in the ordinary moderate vagotonic generally leads on the second day, as the local erythema at the site of injection appears, to a lessening of the oculocardiac reflex, which may be abolished or even reversed. About the fourth or fifth day, when the local erythema has disappeared, there is a temporary return of the reflex, indicating a phase of hypervagotonia preceding the general urticaria. Then the reflex becomes reversed again through a period of two or three days of definite sympatheticotonia, which persists throughout the duration of the urticaria, and then recedes into the normal vagotonic state. In the occasional patients who are sympatheticotonic previous to the serum injection, the latter is followed merely by a slow passage into moderate vagotonia before the local erythema appears. This erythema is, as a matter of fact, inconstant, or at least delayed and greatly attenuated. There is then a gradual return to the preëxisting sympatheticotonia, and the urticaria is generally wanting or is extremely evanescent. In twenty-six cases of measles there was noted a hypovagotonia or sympatheticotonia reaching its acme at the height of the measles eruption and passing off as the eruption faded. Laurent had seen a similar condition in syphilitic roseola and in toxic or drug rashes. In pneumonia, broncho-pneumonia and typhoid fever there is a marked hypervagotonia as the temperature rises, followed by a more or less stable sympatheticotonia which persists until defervescence. Scarlet fever, however, reacts differently, showing in some instances a persistent hypervagotonia and in others irregular alternations of vago and sympatheticotonia. These alternations generally correspond with changes in blood pressure, the stages of hypervagotonia occurring along with sharp drops in the pressure. The case with the most pronounced hypervagotonia was one of severe scarlet fever with evidences of adrenal insufficiency, viz., blood pressure 95 mm. Hg, cyanosis of the limbs, extreme weakness, livid eruption at the knees and elbows, and a broad white line phenomenon, with complete disappearance of the scarlet rash in an area four or five centimetres wide. The authors suspect adrenal insufficiency with impaired sympathetic tone, giving free play to the opposed parasympathetic, to be a factor in the paradoxic hypervagotonia of scarlet fever. Some as yet unreported investigations have shown the importance of the endocrine glands in the regulation of vagosympathetic tone.

Experimental Inoculation of Human Throats With Virulent Diphtheria Bacilli.—C. G. Guthrie, B. C. Marshall, and W. L. Moss (*Bulletin of the Johns Hopkins Hospital,* December, 1921) used for this work inoculations of a virulent diphtheria bacillus obtained from the throat of a healthy carrier, obtaining from the investigation the following results: The carrier state was produced in seven of eight individuals, the probable duration varying from thirty-three to fifty-five days plus. The effect of diphtheria antitoxin in preventing the colonization of the organisms introduced was not complete or striking, and it is believed that it probably had no influence whatever in preventing the development of the carrier state. Such organisms are capable of producing clinical diphtheria, and when isolated in pure culture from the human throat after a prolonged sojourn there, they showed no alteration in morphology or in their staining or cultural characteristics. The authors conclude that the guineapig test is a reliable index of the inherent ability of diphtheria bacilli to cause clinical diphtheria in susceptible human beings, and the Schick test is a reliable index of the presence or absence of antitoxic immunity against diphtheria.

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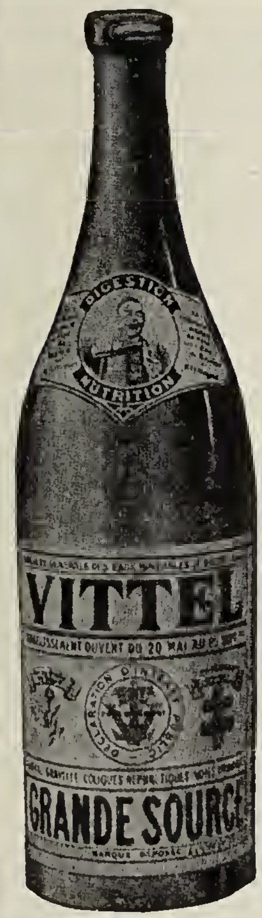

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Diphtheritic Otitis Media.—William J. Mellinger (*California State Journal of Medicine,* April, 1923) writes that he has seen eleven cases in three years, of infection of the middle ear with Klebs-Loeffler bacilli; only one of these was a primary infection with virulent diphtheria bacilli. The writer thinks that infection of the middle ear with nonvirulent diphtheria bacilli is of rather frequent occurrence and would be recognized if all cases of middle ear infection were cultured routinely. Instillations of argyrol into the nose and filling of the external auditory canal with sixty per cent. alcohol for twenty minutes was a successful routine treatment.

Diet During Pregnancy.—Eugene Cary (*Illinois Medical Journal,* March, 1923) divides gestation into three periods, from a dietary viewpoint. The first period corresponds to the first three months and during this time it is essential to crowd carbohydrates and supply small quantities of nourishment at frequent intervals. The second period is from the third to the eighth month, and here it is necessary to overcome intestinal stasis and supply adequate calcium in the diet. The third period is composed of the eighth and ninth months. In this last period we must overcome a tendency of the fetus to overgrow, and we must adjust the diet of the mother in such a manner that there cannot be an accumulation of uric acid and nitrogenous waste products in the body.

Heliotherapy in Infectious Diseases of Bones and Joints.—Emil S. Geist (*Minnesota Medicine,* April, 1923) believes that there are many other chronic infections of bones and joints besides tuberculosis which are benefitted by the rays of the sun properly used. These conditions are osteomyelitis, chronic arthritis, gonorrheal arthritis, rickets, influenzal swollen joints and circulatory disturbance of the feet. There are few dangers in the application of heliotherapy, and it can be used at home as well as in an institution. The point of the treatment is to achieve a tan but not a burn. Geist believes that the time has come for hospitals to use their roofs and porches and surrounding grounds for the application of heliotherapy.

Pharmacodynamic and Therapeutic Properties of Geneserine.—H. Surmont and M. Polonovski (*Bulletin de l'Académie de médecine,* February 27, 1923) note that in 1915 Polonovski and Nitzberg isolated from Calabar bean a new alkaloid, geneserine. This substance is only feebly basic and yields no crystalline salts with mineral acids, but on mixing solutions of it and of salicylic acid in ether there is obtained on evaporation a crystalline salicylate of geneserine. The latter is present in Calabar bean in equal or even greater amount than eserine. Its toxicity was found to be considerably lower than that of eserine, though in many respects its physiological effects are similar. It markedly stimulates smooth muscle tissue, including that of the intestine, and increases the salivary, pancreatic, and probably the intestinal secretions. It slows the heart by stimulating the cardioinhibitory centre, this effect no longer taking place when the vagi are cut. Whereas eserine slows the heart only after the appearance of toxic effects, such as vertigo and syncope, geneserine, in hypodermic doses of one to five milligrams, slows it without any toxic effects. In five cases of nervous dyspepsia of the hypopeptic type, coupled with Moutier's solar syndrome, rapid disappearance of painful epigastric palpitations and vasomotor disturbances of the face, with restoration of normal sleep, was obtained by daily ingestion of three quarters to one and a half milligrams of geneserine salicylate, divided into three doses before meals.

Levator Hernia.—H. C. Chase (*Surgery, Gynecology, and Obstetrics,* December, 1922) states that while it is obvious that no conclusions can be drawn from one case, nevertheless from a study of the thirteen cases reported, the anatomy as shown in his case and in cadaver dissections studied, he feels justified in making the following deductions: 1. Pudendal hernia, although extremely rare, should be easily recognized (three points). 2. All cases should be divided into anterior, posterior, or combined types as the basis of operation. 3. Every case should be submitted to operation. 4. A knowledge of the anatomy, the type presented and application of the principles of the operative treatment of all herniæ should result in a cure in a large majority of cases.

Weight Reduction: Further Consideration of Its Effect on High Blood Pressure.—Robert H. Rose (*American Medicine,* January, 1923), from further experience with weight reduction and its effect on high blood pressure, concludes as follows: High blood pressure frequently drops quickly during weight reduction, and remains lower as long as a normal diet is followed. Many symptoms are relieved at the same time, such as palpitation, dyspnea, angina pectoris, and certain forms of headache. When the heart is embarrassed and the pulse irregular with high pressure, this treatment may relieve the whole group of symptoms. The results may be explained by the lessening of a toxemia due to carbohydrate fermentation and the creation of a beneficial intestinal flora.

Diagnosis of Cancer by Means of Serum Reactions.—J. A. Shaw-Mackenzie (*Lancet,* October 7, 1922) draws attention to a new test of cancer by means of a turbidity reaction in the serum. This test consists in adding an ether extract of cancer tissue, with or without saponification, to cancer serum. This is followed by an appearance of turbidity after incubation, which does not appear at all, or not to the same extent, with noncancerous serum. It is essential that the serum used should be as clear as possible, as otherwise it becomes necessary to differentiate between relative turbidities, this being especially marked in diabetic cases.

Attempts at Detoxication. — From experimental evidence, Karl Mayer (*Schweizerische medizinische Wochenschrift,* August 24, 1922) draws the conclusion that the nature of the action of cocaine is not a chemical one, but rests upon physicochemical colloidal processes. The toxic effect of cocaine may be diminished in experimental animals by the administration of calcium salts; cocaine is a pseudoantagonist of calcium and its effectiveness may be inhibited by calcium and increased by potassium, and therefore the manner of the action of cocaine is dependent upon the ionic balance between calcium and potassium. This antagonism between cocaine and calcium is dependent upon a change in the condition of the lipoids, especially of lecithin.

Convalescence

following the acute infections, such as **influenza, pneumonia, bronchitis, diphtheria, scarlet fever and measles, as well as after surgical operations, child birth,** and so on, is rapidly promoted and hastened by the systematic use of

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Dysmenorrhea

is one of the most common and intractable affections that tax the skill of the practitioner. Fortunately, in

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the practicing physician has a remedy that, owing its beneficial action to its regulation of the utero-ovarian circulation, promptly reduces the local congestion and thus effects an early relief from pain. Not the least, therefore, of the notable advantages of Hyperol, is the way it obviates, in the great majority of cases, any necessity for opiates or narcotic drugs, with their all too evident dangers.

But it is through its restoration of normal functions of the uterus and ovaries that Hyperol accomplishes its greatest benefits, for it thus enables medical men to produce results in **amenorrhea, dysmenorrhea, subinvolution and kindred** ills that are possible with few other remedies.

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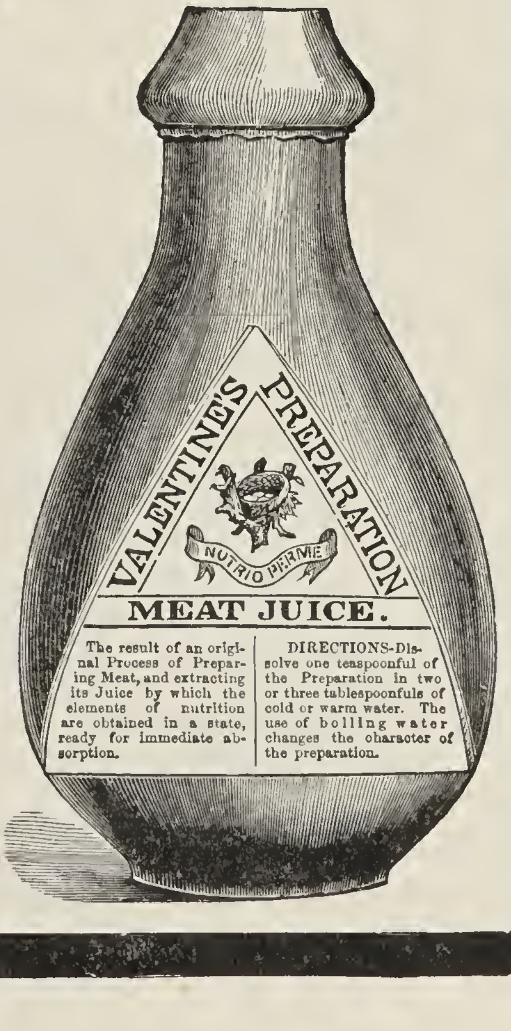

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Miscellany.

Treatment of Cholelithiasis.—Farquhar Macrae (*British Medical Journal,* November 25, 1922) says that the radical treatment of gallstones is purely surgical. It is very doubtful whether much can be done by medical treatment to diminish the liability to attacks of colic, or to palliate the accompanying dyspepsia. Any attempt to render the bile antiseptic by such drugs as urotropine in doses which would not do harm otherwise seems obviously futile, and it is very doubtful if the bile can be so altered in consistency by drugs as to affect its amount or its rate of expulsion. But the great majority of victims of cholelithiasis suffer throughout only from indigestion, and if they are willing to submit to the discomfort and inconvenience of this it is doubtful whether the surgeon is justified in urging operation upon them.

Treatment of Diabetic Gangrene.—Howard F. Root (*Boston Medical and Surgical Journal,* December 14, 1922) reports seven cases in which operation was successfully performed. The prevention of gangrene of the feet in diabetes depends on conservation of the circulation by exercises, massage and rest, avoidance of cutting corns, pricking blisters, cutting toenails too closely, and careful aseptic treatment of minor lesions. The first step in the treatment of infections is to secure circulatory support by elevation of the foot. If gangrene and infection are established amputation is indicated as soon as nonoperative treatment ceases to give improvement. Operation is practicable in the presence of sugar, acidosis, or both. Fat or aged patients should not have fasting treatment in preparation. During forty-eight hours before and after operation the diet should consist of a moderate, or for a diabetic a liberal supply of carbohydrate food in the form of orange juice, oatmeal gruel with skimmed milk, shredded wheat, soda biscuits and egg albumen. Spinal anesthesia is the first choice, gas and oxygen the second, ether only as a last resort and for the briefest space of time.

Chemical Changes in the Blood of the Dog After Intestinal Obstruction.—Russell L. Haden and Thomas G. Orr (*Journal of Experimental Medicine,* March, 1923) studied the blood chemistry of normal dogs and of dogs in which various types of intestinal obstruction were produced. After ligation of the duodenum, ligation of the duodenum and gastroenterostomy, and ligation of the ileum, there was a gradual fall in the chlorides and a rise in the CO_2 combining power, with an increase in the nonprotein nitrogen. The changes in the chloride metabolism are the most striking feature of the intoxication due to high obstruction. The authors suggest that the fall in chlorides is probably due to a utilization of the chlorine ion in the course of the intoxication, and that this use of chlorine may be a protective measure on the part of the body. The sugar, uric acid, and creatinin show nothing unusual. The urea nitrogen was found to be a good index of the protein destruction. It is pointed out that on the basis of the similarity of the blood findings in intestinal obstruction, acute lobar pneumonia, and serum disease, these widely varying conditions may have a common chemical basis.

Sodium Citrate in Congestive Disorders.—J. Lépine (*Presse médicale,* June 24, 1922) calls attention to the value of sodium citrate in congestive states or chronic disturbances of the circulation unassociated with marked vascular lesions, notably in uricemic cases and in the congestive disturbances of the menopause. Doses of two to six grams a day may in many patients be continued for a long period without untoward effects, and the remedy proves very useful in reëstablishing circulation.

Supplementary Protein Value of Peanut Flour.—Walter H. Eddy and Rena S. Eckman (*Journal of Biological Chemistry,* February, 1923) describe experiments in which the protein supplementary power of peanut flour is compared with that of muscle protein by feeding rations which contained only about ten per cent. of protein, six or seven per cent. of this being contributed by wheat flour, and the rest by peanut flour or meat residue, respectively. These rations were further supplemented by three per cent. of butter fat, four per cent. salts, and brought to nearly equal calorie value to the gram. The animals fed on the peanut flour showed slightly better growth than those fed on meat, and were markedly superior in reproduction. The actual protein intakes on the two diets did not vary widely, the calculated difference being 0.08 gm. daily. The peanut series intake averaged slightly more per day than the meat series.

Pernicious Anemia: An Analysis of 117 Cases.—P. N. Panton, A. G. Maitland-Jones and George Riddoch (*Lancet,* February 10, 1923) studied the clinical records of 117 patients, of whom the average age was forty-six years, ranging from twenty to sixty-eight, and the average duration of symptoms up to admission to the hospital was seventeen months, ranging from seven days to six years. Weakness occurred in 107 patients, in forty-nine of whom it was the chief complaint. Thirty-three patients noticed a change in color. The chief complaint of eight patients was loss of weight and twenty-six seemed to be emaciated. Fever, with an average range of temperature between 99° and 100° F., occurred at some time in ninety cases. Generally, disappearance of the fever occurred simultaneously with improvement in the general condition and also the more acute the condition the more constant was the presence of fever. Eighty-six patients complained of gastrointestinal symptoms; in fifty-three cases such complaints were primary. Fifty-one patients complained of vomiting, thirty of diarrhea, twenty-six of anorexia and twenty-four of epigastric pain.

Oral sepsis has no definite etiological significance in pernicious anemia, although it may produce a secondary anemia. While achylia is a frequent occurrence, it is not an essential etiological factor. Hematemesis occurred in three patients, but was copious in only one. The spleen was palpable in twenty-one cases and the liver was enlarged in nineteen cases. Sixty-three patients complained of cardiovascular symptoms and sixty-two had cardiac murmurs. Twenty-five patients complained of headache and eighteen of numbness and tingling of the hands and feet. The urine showed albumin in twenty-four patients, bile in two and sugar in one. The author warns against accepting the reports of cures in pernicious anemia without confirmation.

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Indications for Opium in Cardiac Therapy.—Daniel Routier (*Journal de Médécine de Paris,* March 17, 1923) advises opium in anginiform crises, in acute edema of the lungs, and in dyspnea of cardiac insufficiency. Morphine may be used in the sleeplessness of complete cardiac decompensation, and instead of diminishing the urinary output in dropsical cases it usually increases it. In attacks of paroxysmal tachycardia it is also indicated, especially in those which last for days at a time and which tend to produce cardiac insufficiency from distention. Finally, morphine is a drug which the cardiologist has frequent occasion to use, and, while its action is indirect, it adds greatly to the comfort of the cardiac patient and really merits a place among the cardiac tonics.

Extrapleural Thoracoplasty in the Treatment of Pulmonary Tuberculosis.—P. Bull (*British Medical Journal,* December 23, 1922) states: 1. That good results can be achieved by means of extrapleural thoracoplasty in cases of unilateral or mainly unilateral pulmonary tuberculosis which is not cured by rational expectant treatment or pneumothorax. 2. That an operation should be performed only after an exhaustive conference with the attending physician on the case, who must have been enabled by observation during a considerable period, to form a well considered opinion of the prognosis with continued expectant treatment. 3. That resection of the ribs should be carried out, under local or general anesthesia, through a paravertebral incision, so that the posterior part of the ribs from the eleventh, or in any case, from the tenth to the first inclusive, can be removed. 4. That if a cavity remains, it can be brought to collapse by means of intrathoracic transplantation of fat. 5. That medical practitioners should acquire knowledge of the indication and results of this operation, as one third of the patients, who would otherwise be doomed, can be saved thereby.

Emetine Bismuthous Iodide in the Treatment of Amebiasis.—P. Manson Rennie (*Lancet,* December 30, 1922) finds that the therapeutic action of emetine bismuthous iodide may be considered to have a definite curative effect on amebiasis, although sometimes it may be necessary to carry out two or three courses to effect a cure. Emetine injections, although palliative, cannot be considered a cure in this sense. The following rules should be observed in regard to its administration: 1. The treatment must be regulated by the tolerance of the patient; the drug need not be pushed to tolerance in every case. 2. The patient must be treated in bed; the diet should be light and easily assimilated and may be varied with toast and eggs and not necessarily confined to milk. 3. Delayed vomiting (four hours, after taking the drug) does not indicate that the drug will not be absorbed, but rather that it is beginning to take effect. 4. Diarrhea is of favorable import and is typical of this drug; there are usually three or four diarrheic movements a day, resembling the dregs of meat extract. 5. The restriction in diet for a month or so after treatment is important and the patient should receive advice on this point before discharge. 6. The increase in weight is very striking after a successful course of treatment with emetine bismuthous iodide.

Varicella and Ultraviolet Rays.—Arnold Sack (*Münchener medizinische Wochenschrift,* No. 16, 1922) suggests that it is very probable that a preliminary irradiation with ultraviolet rays markedly sensitizes the skin and that it activates and mobilizes the process of the eruption in varicella to a marked degree.

Sheep Asthma and Its Cure by Repeated Skin Reactions.—Trabaud and Charpentier (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris,* March 29, 1923) report the case of a soldier who suffered from nightly attacks of precordial discomfort and constriction, paroxysmal cough and wheezing which continued until dawn. Inquiry revealed that he had had occasional attacks of this sort ever since the age of six years. An attack could be brought on at will by holding his nose for a few minutes in a bit of wool freshly shorn from a laboratory animal. The symptoms began in three minutes and in seven minutes the leucocyte count dropped from 7,200 to 3,400. The treatment consisted in applying for a few hours, at first daily, then on alternate days, two samples of sterilized wool, one from a sheep and the other from a mattress, on scarified areas of one centimetre size over the opposite deltoids. The reactions on the two sides were alike throughout. On the first day, there developed at once a patch of giant urticaria, which disappeared rapidly when the dyspnea set in at night. On succeeding days the reaction became progressively less and the attacks of dyspnea simultaneously became milder. In two months the patient was cured, and could sleep on a wool mattress without symptoms. Attention is called to the prolonged maintenance of noxious properties in the proteins of the mattress and the fact that these properties were not annulled by sterilization.

New Method of Testing Liver Function With Phenoltetrachlorphthalein.—Sanford M. Rosenthal (*Bulletin of the Johns Hopkins Hospital,* December, 1922) says that the results reported by his method are quantitative and within certain limitations are independent of the condition of the bile channels. He believes that the rate at which the liver removes the dye used from the blood stream gives an index of the functional capacity of the entire organ. Phenoltetrachlorphthalein was injected intravenously into normal dogs, into those in which chloroform poisoning and phosphorus poisoning had been produced, and into animals in which the common and cystic bile ducts had been ligated. The following experimental results are noted: The concentrations reached in the plasma of normal dogs, after five mg. to the kilo injections, were strikingly constant. Approximately ten per cent. is present in two minutes, eight per cent. in three minutes, and from a large trace to absence in fifteen minutes. The rate of disappearance was higher in two cats, and more rapid in one rabbit. Variation of the dose has a direct influence on the curve obtained. After injury to the liver parenchyma there was a marked increase in these concentrations, with a greatly prolonged rate of disappearance. If repair has taken place the curves approach normal. In jaundice due to mechanical obstruction the curves differ widely from those obtained in jaundice associated with extensive degeneration of the hepatic cells.

Convalescence

following the acute infections, such as **influenza, pneumonia, bronchitis, diphtheria, scarlet fever and measles, as well as after surgical operations, child birth,** and so on, is rapidly promoted and hastened by the systematic use of

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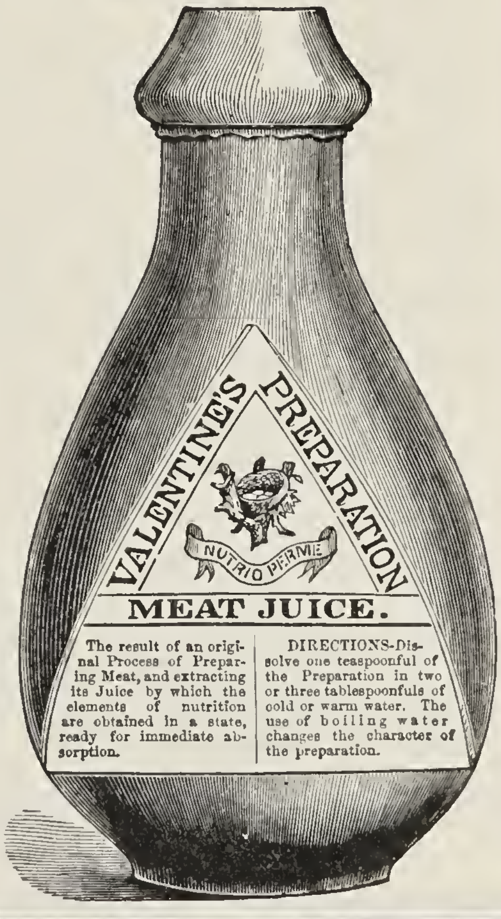

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MISCELLANY.

Wassermann Reaction in the Johns Hopkins Hospital.—Albert Keidel and Joseph Earle Moore (*Bulletin of the Johns Hopkins Hospital*, January, 1923) present the results of a statistical survey of the sera of about forty-five thousand patients on whom Wassermann tests have been done since January, 1918. The material is of sufficient magnitude to make possible the drawing of accurate conclusions. The chief point brought out by this study, the results of which are too detailed to describe here, is the necessity of making a Wassermann test a routine procedure on every patient who enters a hospital.

Quantitative Flocculation Test for Syphilis.—Henry M. Feinblatt (*Journal of Laboratory and Clinical Medicine*, December, 1922) in a comparison of five hundred cases with the Wassermann, using a simplified Sachs-Georgi technic, obtained the same result in 93.8 per cent. of the cases in which parallel Sachs-Georgi and Wassermann tests were carried out. In the thirty-one conflicting cases, sixteen were positive to the Sachs-Georgi and fifteen to the Wassermann. In the sixteen patients who gave a positive Sachs-Georgi and a negative Wassermann, fifteen showed definite clinical evidence of syphilis. Eleven of the fifteen patients with a positive Wassermann but negative Sachs-Georgi showed definite clinical evidence of syphiliis.

Benign Albuminuria of School Children.—On examining five thousand school children Paul Lauener (*Schweizerische medizinische Wochenschrift*, December 21, 1922) found that 6.7 per cent. of those between the ages of six and seven years showed albuminuria, as did also twenty-seven per cent. of those between the ages of ten and eleven years, and thirty-eight per cent. of those between fifteen and sixteen years of age. The group of children that came from more prosperous homes and showed more marked growth showed more cases of albuminuria. The kidney is involved only as an excretory organ and the growth is subjected to its own conditions of metabolism, which lead to albuminuria. Treatment for this condition is unnecessary and may even be harmful, as it results in psychoneurotic conditions.

Recent Investigations on the Coagulation of Blood.—A. Fonio (*Sshweizerische medizinische Wochenschrift*, January 11 and 18, 1923) conducted some investigations on the various factors of coagulation, on the valence and time of coagulation, and on the tensile strength and retractility of the thrombus in different diseases and according to his own technic; he determined their relation to one another and also the dependence upon the number of platelets, etc. The diseases in which these were studied are exophthalmic goitre, myxedema, cretinism, tuberculosis, pregnancy, leucemia and hemophilia. Plasma rendered incoagulable and deprived of all the formed elements coagulates on the addition of thrombin, but the retraction of the fibrin occurs only if blood platelets have been added originally. Erythrocytes and leucocytes behave indifferently toward coagulation. The retractility is of special significance as it produces physiological ligation of the bloodvessels; if it does not occur, severe hemorrhages and secondary hemorrhages occur very readily with operations. In hemophilia the thrombin is insufficient or inadequate in amount, the fibrinogen being sufficient.

The combined blood examination enabled the author to know before the operation whether the hemorrhage would be severe, normal, or abnormally slight (myxedema) and whether secondary hemorrhages were to be feared; he was also enabled to improve the coagulability of the blood by preliminary treatment (with coagulen). In this way hemophilia, purpura, etc., may be differentiated diagnostically, and it is also possible to ascertain whether the deficiency of fibrinogen and thrombin, or whether the physical and physiological properties of the white thrombus and the formation of the fibrin is the cause of the hemorrhages in leucemia, secondary anemia, etc. The treatment will naturally be directed accordingly.

Sudden Death from Anaphylactic Shock.—F. W. Sumner (*British Medical Journal*, March 17, 1923) reports a case of sudden death within five minutes after a prophylactic dose of one thousand units of diphtheria antitoxin. There was no previous injection of any sort. This was probably a case of status lymphaticus with enlargement of the tonsils and adenoids and a persistent thymus. The patient showed an intolerance to the vicinity of horses. The horse serum is no doubt the offending factor in these cases. To avoid such accidents the author recommends a preliminary intravenous injection of 0.5 c. c. of the ten per cent. diluted serum and, if no adverse symptoms arise in an hour, the subcutaneous injection of the remainder of the dose should eliminate the possibility of anaphylactic disaster; a preliminary intravenous injection of a preparation consisting of sodium carbonate five grains, gum arabic one dram, glucose one dram, in normal saline solution up to thirty c. c., together with an intramuscular injection of a sterile solution of one grain of calcium chloride dissolved in ten minims of normal saline solution an hour before the serum injection, should also do away with any chance of anaphylaxis.

Therapeutic Increase of the Coagulating Power of the Blood, Especially in Surgery.—As a result of his own observations and an extensive study of the literature, P. F. Nigst (*Schweizerische medizinische Wochenschrift*, December 21 and 28, 1922) comes to the conclusion that hemorrhage and the coagulation of blood show a distant relationship, as is generally assumed. It has been shown that a few drugs lead to an increased power of coagulation of the blood in vitro, but this does not prove that they are hemostyptics in the body. Clinically and therapeutically, these are variously estimated in the literature and opinions are even contradictory. The author agrees with those who deny their value. Stimulating röntgen irradiations of the spleen as well as of other organs and also in splenectomized patients, increase the coagulating power of the blood in vitro, but this fact has no significance in practical hemostasis in surgery. In this respect, the local application of the remedies having an accelerating effect on coagulation of the blood (according to the author's experience best as a tampon in the form of a piece of muscle, peritoneum, or fat) is recommended. These local applications of hemostatics may be useful, but only the classical surgical methods are reliable.

Bowel Torpor in the Elderly

is usually the result of a progressive atony of the bowel, with a gradual decrease of the natural mucus and other secretions. The loss of moisture dries the feces and interferes with their free and easy passage. Under such conditions

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serves as a safe and efficient substitute for the physiologic secretions. Following its systematic use, the bowel contents are kept soft, the intestinal canal—especially the large intestine—is adequately lubricated, and the feces are passed along and evacuated in due time without straining, pain, or discomfort.

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The Vitamine Content of Certain Proprietary Preparations.—The experiments recorded by Katharine H. Coward and A. J. Clark (*British Medical Journal,* January 6, 1923) show that in none of the proprietaries examined were the vitamines concentrated on the commercial scale. This result was only to be expected, for the concentration of the two more stable vitamines (A and B) is a most difficult process, even on a laboratory scale, and when successful the final yield of purified vitamine represents a minute fraction of the total quantity of vitamines present in the raw material. These experiments show that under normal conditions of life an adequate supply of vitamines can be easily ensured by including in the diet a suitable amount of "protective foods," such as milk, butter, green vegetables and fruit, and that no advantage is to be gained by trying to obtain these substances in drug form.

Vaccination Against Varicella. — Wilhelm Knoepfelmacher's studies (*Monatsschrift für Kinderheilkunde,* A. Czerny Festschrift, March 25, 1923) show that: 1. In varicella, it is possible to produce vesicle formation (varicellization) by the inoculation of the vesicular contents. 2. The contents of the inoculated vesicles can be reinoculated, and therefore contains the specific virus. 3. It is probable that a generalized exanthem may be produced in this way. 4. It is practically proved that varicella may be transmitted in this way. 5. The local inoculation leads to a protection by inoculation, which need not become evident before the nineteeenth day after the inoculation. 6. Reinoculation in successfully varicellized patients remains negative, as well as in children who have recovered from varicella. 7. Experiments on complement fixation for the demonstration of antibodies in varicellized are necessary; the experiments detailed by the author were without result.

Kidneys and Tonsillar Infection.—Edmund Cautley (*Archives of Pediatrics,* February, 1923) states that tonsillar infection is often the cause of hematuria and albuminuria, or even acute nephritis and that tonsillectomy is a necessary mode of treatment. These attacks are more common in children than in adults. They are usually mild and end in recovery in two to six weeks; occasionally they are severe and end in chronic albuminuria. The mildest type of case is characterized by bloody discoloration of the urine and albuminuria; there may be a few hyaline and granular casts. There is usually a slight or no fever and the child appears perfectly well. The kidneys can excrete dead or living bacteria without setting up nephritis; even if there is an actual nephritis it need not necessarily be either severe or generalized. A focal infection and local damage in one kidney can explain the mild cases. From the diagnostic viewpoint, a focus of infection, especially in the tonsils, should be sought. The treatment includes a diet of milk and carbohydrates, fruit and vegetables; citrate of potash during the stage of hematuria and a mild preparation of iron. Vaccine treatment does not seem necessary. The author recommends a watchful waiting policy with the enucleation of the tonsils until the local infection has subsided and the blood has disappeared from the urine, except in severe cases (uremic symptoms), when it might be advisable to operate earlier.

Blood Sugar Content of Capillary Blood as Compared With That of Venous Blood.—Isaac Neuwirth and Israel S. Kleiner (*Journal of Laboratory and Clinical Medicine,* May, 1922) found in twenty individuals that the capillary blood sugar closely parallels the venous blood sugar, and for all clinical purposes may be accepted as equivalent.

Backache.—William Dameshek (*Boston Medical and Surgical Journal,* December 7, 1922) divides treatment into general and local. General treatment consists of measures against constipation, visceroptosis, underlying complexes, wrong methods of standing or walking, etc. Local measures are, 1, for mild cases, a belt or adhesive strapping; 2, for more severe cases, a course of rest and then a tight corset; 3, for severe cases, the breaking of adhesions by manipulation—the osteopathic method.

A Cytological Study of the Nature of Rickettsia in Rocky Mountain Spotted Fever.—F. M. Nicholson (*Journal of Experimental Medicine,* February, 1923) presents evidence to show that Rickettsia are entirely distinct from all known cellular components. Diplobacillary forms were most abundant in the early stages of the reaction, and single bacillary bodies towards the termination. Other slight differences in morphology from Wolbach's account were noted in the organisms in the tissues of both ticks and guineapigs.

Special Training in Home Nursing.—Alfred Worcester (*Boston Medical and Surgical Journal,* October 5, 1922) maintains that the greatest need of nursing service is now, always has been, and always will be, in the home of the patient; that special training for home nursing is necessary; that this can be given only in the home, and that it can best be given during the nurse's pupilage. It is unfair, both to the public and to the pupil nurses, for a training school not to include this special training in its curriculum.

Studies on Lymphoid Activity.—Waro Nakahara (*Journal of Experimental Medicine,* April, 1922) has demonstrated by this study that resistance to transplanted cancer may be induced in mice by the intraperitoneal injection of olive oil. The maximum degree of resistance appears to be about the tenth day. Histologically, before the establishment of resistance, there is a proliferation of the cells of the lymphoid germ centres, and after the cancer inoculation, there is lymphoid infiltration about the grafts, a second stimulation of the lymphoid germ centres and an increase in circulating lymphocytes.

Pathogenesis of Köhler's Disease.—P. Caffier (*Monatsschrift für Kinderheilkunde,* March, 1923) concludes that both internal and external causes are concerned in the development of the sharply circumscribed symptom complex of Köhler's disease. The most probable course is an inhibition in development and trauma. A severe injury of the foot is probably associated with injury of the bloodvessels, resulting, possibly, in a diminution in the blood circulation of the navicular bone, while every growing bone requires an increased blood supply. It is possible that as a result of this hypothetical disturbance in nutrition only a diminution of the transformation of the cartilage into bone results, but not an inhibition of the proliferation of the cartilage.

Convalescence

following the acute infections, such as **influenza, pneumonia, bronchitis, diphtheria, scarlet fever and measles, as well as after surgical operations, child birth,** and so on, is rapidly promoted and hastened by the systematic use of

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the practicing physician has a remedy that, owing its beneficial action to its regulation of the utero-ovarian circulation, promptly reduces the local congestion and thus effects an early relief from pain. Not the least, therefore, of the notable advantages of Hyperol, is the way it obviates, in the great majority of cases, any necessity for opiates or narcotic drugs, with their all too evident dangers.

But it is through its restoration of normal functions of the uterus and ovaries that Hyperol accomplishes its greatest benefits, for it thus enables medical men to produce results in **amenorrhea, dysmenorrhea, subinvolution and kindred** ills that are possible with few other remedies.

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MISCELLANY.

Early Diagnosis of Acute Appendicitis.—R. Rove (*Presse médicale*, May 5, 1923) lays stress on an epigastric syndrome met with at the outset in severe cases of appendicitis. It occurs, on an average, in the first six hours of the attack, preceding the well known manifestations in the right iliac region. The patient complains of severe pain in the epigastrium and vomits frequently. In bed he lies on his back, but the thighs are not flexed on the abdomen. Examination reveals marked tenderness confined to the left upper epigastric region, together with cutaneous hyperesthesia in the same area. The upper portion of the left rectus is contracted and rigid. On the other hand, in the right iliac region there exists, in the majority of cases, no rigidity, tenderness or hyperesthesia. Celiotomy in this early stage reveals that the great omentum is traveling toward the appendix, from which it is separated by a distance corresponding to the time elapsed since the appearance of the epigastric symptoms. In the latter part of the disturbance the omentum is closely applied to the appendix, which shows a gangrenous area and soon after perforation. Operation before the syndrome has ceased, i. e., before the appearance of signs in the right iliac region, is a sure preventive of peritonitis and saves the patient from almost certain death. This syndrome is rarely observed in hospitals, too much time having elapsed from the onset and the time of admission. It is perhaps to be ascribed to irritation of the nerves of the great omentum, due either to its rapid displacement toward the appendix or to the extreme toxicity of the products absorbed by it. The omentum being derived from the dorsal part of the primitive mesogastrium, i. e., from the vicinity of the greater curvature of the stomach, the irritation doubtless becomes manifest in sensory and motor evidences in the epigastric region, as though the greater curvature were diseased. Enriquez, Guttman, and Rouvière, moreover, have shown that pressure by the inflamed appendix induces a hypotensor reflex which seems to travel by way of the solar plexus and appears as a reflex of acute excitation of the pneumogastric.

Iodine in the Treatment of Refractory Malaria.—Cheinisse (*Presse médicale*, May 5, 1923) refers to the experiences of Roubachkine in treating twenty cases of refractory chronic malaria with iodine, administered either in the form of a ten per cent. iodine tincture, of which five to ten drops were given twice daily, or of a solution of two grams of iodine and five grams of potassium iodide in one hundred grams of water, of which twenty to thirty drops were taken twice daily. Continued for about a month, this treatment brought about cessation of the recurrences in all but two cases. In spite of this, blood examinations showed persistence of the process of schizogony in the parasites, although no febrile paroxysms occurred. The spleen in some instances was reduced rapidly and markedly; in others, remained unchanged. Iodine seemed to reactivate quinine. In two cases due to plasmodium præcox, in which gametes remained in the blood in spite of the prolonged use of quinine, six or seven days of iodine treatment, followed by three injections of 0.5 gram of quinine caused the gametes to disappear. Good results were obtained in refractory chronic cases by the combined use of iodine and quinine in the form of a mixture in equal parts of five per cent. tincture of iodine and ten per cent. alcoholic solution of quinine hydrochloride, of which twenty-five drops were taken by mouth twice a day for three successive days in each week, the treatment being continued for at least two months. In other instances injections of a mixed solution made by means of the addition of antipyrine were given deeply in the subcutaneous cellular tissues, with gratifying results. Acute paroxysms in chronic cases resistant to quinine were rapidly cut short by such injections, which also proved valuable in severe chronic cases with complications such as edema and ascites.

Practical Points on Purgation.—Lewis W. Elias (*Southern Medical Journal*, August, 1923) protests against the theory that the first thing in case of illness is a thorough, and often continuous, clearing of the alimentary canal. His point is not that laxatives should never be given, but that they should be given only for a definite indication, and then with proper safeguards. Two such indications are: The presence of symptoms definitely suggesting the injurious intestinal absorption that enemas have failed to relieve, and an edematous patient who may need depletion. Merely because a patient is sick is no reason for a purge. Most patients are best helped by water, food, and such hygienic measures as tend to build up their resistance. If the lower bowel needs emptying, do it with an enema. A purge draws a large amount of water from the body tissues, so when a purge is given the patient should also be given plenty of water. The same care and thought should govern the use of a cathartic as the use of any other drug.

Renal and Hepatic Forms of Glycosuria.—M. Labbé (*Paris médical*, May 5, 1923) adduces cases illustrating the fact that, in the diagnosis of diabetes mellitus, there must be taken into account instances of disturbance of glucose metabolism dependent upon the nervous system, the ductless glands, the kidneys, and especially the liver, which differ materially in their clinical course from diabetes. In the latter, the disturbance of glycoregulation is more intense; it is permanent and, in the severe cases, even progressive; in the severe cases, too, it is associated with disturbances of protein and fat metabolism. In nondiabetic glycosurias, the disturbance of glycoregulation is transitory and generally curable. It exhibits no tendency to progress, and any associated disturbance of protein and fat metabolism is much less intense than in severe diabetes. The treatment is likewise very different. Reduction of carbohydrates is not indicated; indeed, in glycosuria of hepatic origin, recovery is best secured by suppression of meat, reduction of fats, and a diet of milk and starches. Thus in all cases of glycosuria, especially in young subjects, an exact diagnosis is needful. It should be based not only on the clinical data, but also particularly on blood sugar determination and tests for hyperglycerin upon ingestion of glucose. The latter test is indispensable in the more uncertain cases to exclude diabetes mellitus. In hepatic glycosuria the treatment consists, aside from the diet, in stimulating the liver by the administration of hepatic extracts, cholagogues, calomel, and alkaline cures, of which the type is the Vichy cure.

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Icterus Neonatorum.—For the purpose of clearing up the still unknown etiology of icterus neonatorum, G. Linzenmeier and Lillienthal (*Zentralblatt für Gynäkologie,* November 25, 1922) applied the Widal liver function test and found a parallelism between insufficiency of the liver and icterus, in so far as all those newborn infants in whom the test resulted positively and who showed a leucopenia, were later affected by icterus, whereas those with leucocytosis remained free from icterus. It is therefore possible that the icterus neonatorum is based upon an initial insufficiency of the liver in the newborn in the sense of the Yllpö theory.

Colloidal Benzoin Reaction in Disseminated Sclerosis.—Souques, Mouquin and Walter (*Presse médicale,* May 2, 1923) found the colloidal benzoin reaction feebly or definitely positive in eleven out of twelve cases of disseminated sclerosis. The type of response was not constant, sometimes simulating that of general paralysis or that of arrested syphilis, or again, not resembling any of the types ordinarily met with in neurosyphilis. While the colloidal benzoin reaction cannot be regarded as an absolutely specific test for syphilis of the central nervous system, it is only in disseminated sclerosis that a weakly or definitely positive colloidal benzoin test of any type may be found in an otherwise normal cerebrospinal fluid.

Tolysin.—H. G. Barbour, E. Lozinsky, and C. Clements (*American Journal of the Medical Sciences,* May, 1923) give the clinical histories of a number of cases in which they have tried tolysin. Twelve were cases of acute and subacute rheumatic fever, seven of other forms of arthritis. In addition some observations are made upon the action of the drug as an antipyretic and analgesic. Tolysin is the short name of the ethyl ester of paramethylphenylcinchonic acid, which has recently been recommended as an improvement upon the salicylates for the treatment of such diseases as those mentioned. They found it efficient in acute rheumatic fever. The usual dose required for complete relief of the symptoms was from ten to sixteen grams. Partial relief was obtained with seven to eight grams. A satisfactory routine they found to be to give two grams every two hours for three doses, then two grams every four hours. No gastric symptoms were elicited, and albuminuria was increased in only one case. Satisfactory results were obtained in six out of seven cases of arthritis of other types, including acute infections and chronic joint pains. In ordinary colds and headaches its effects appear to be equivalent to those of aspirin, but the action is slower and larger doses are needed. In acute tonsillitis one to two grams, which can be repeated, exert a good antipyretic action. So far as safety is concerned they state that two different patients received each fifty grams of the drug within eight days without any untoward symptoms, and that their recent laboratory investigation seems to show that the body is unable to absorb much more than the therapeutic dose. Finally they maintain that the employment of tolysin may be substituted for any internal salicylate medication, that it is particularly efficient in acute rheumatic fever, and that, on the basis of evidence at present available, it can apparently be administered harmlessly in this and in other forms of arthritis.

Sweating From the Viewpoint of the Loss of Energy.—Max E. Bircher (*Schweizerische medizinische Wochenschrift,* December 30, 1922) was enabled to show that during the proces of sweating (induced by arc lights for ten to twenty minutes) the consumption of oxygen by the body rises on an average thirteen per cent. and this increase, which depends upon an activation of the tissue metabolism, runs parallel with an increase in the body temperature for several hours. The pulse and respiration frequency rise equably with the duration of the irradiation and heating of the body, but the blood pressure sinks (at the most about ten mm. Hg). On the whole, artificial sweating makes only slight demands on the organism and produces a considerable improvement in the condition of many individuals, with a slight diminution of the basal metabolism which is not harmful.

The Blood as a Guide to Early Diagnosis in Lead Poisoning.—Robert Craik (*British Medical Journal,* January 20, 1923) asserts that the presence of the blue line demands careful examination of the patient, but the diagnosis must always be independent of the blue line, which remains only valuable presumptive evidence. In lead poisoning the metal is always present in the urine and remains for weeks or months after treatment is undertaken. Punctate basophilia is more likely to be caused by lead than by anything else. It is pathological and should always be investigated; if it is caused by lead the urine will contain a trace of the metal even in the absence of other symptoms. The diagnosis of lead poisoning should depend, not on gross signs, but on suspicious symptoms and on the investigation of the blood and urine.

Indications for Surgical and Irradiation Treatment of Myomas.—Walter Fürst (*Schweizer medizinische Wochenschrift,* July 6, 1922) thinks that it is very difficult to decide whether irradiation is preferable to operation in some cases of myoma. He calls particular attention to those very large tumors where palpation is impossible and where it is desirable to exclude every suspicion of malignancy before resorting to irradiation. Palpation of the external contour of the tumor is not sufficient, but frequently the dilatation of the cervical canal, digital exploration of the uterine cavity, and the microscopic examination of the mucosa, or a protracted period of observation cannot be dispensed with. Only with such a procedure is there the possibility of subjecting only such cases of myoma to irradiation as can positively be relieved of symptoms by the x rays. The author maintains that those clinicians and physicians who assume the responsibility of the irradiation treatment, should at least keep the patients, in whom no curettage was done, under observation. He examines all women, who were treated once with irradiation, every three or four months, to determine any change in the matter of the hemorrhage or other symptoms and he endeavors to control the findings during the first few months after irradiation, in women suffering with carcinoma and myoma. With early irradiation at a single sitting, the patient is soon discharged, provided the proper indication for treatment was established. In this way the more or less protracted staying in bed is done away with.

Convalescence

following the acute infections, such as **influenza, pneumonia, bronchitis, diphtheria, scarlet fever and measles, as well as after surgical operations, child birth,** and so on, is rapidly promoted and hastened by the systematic use of

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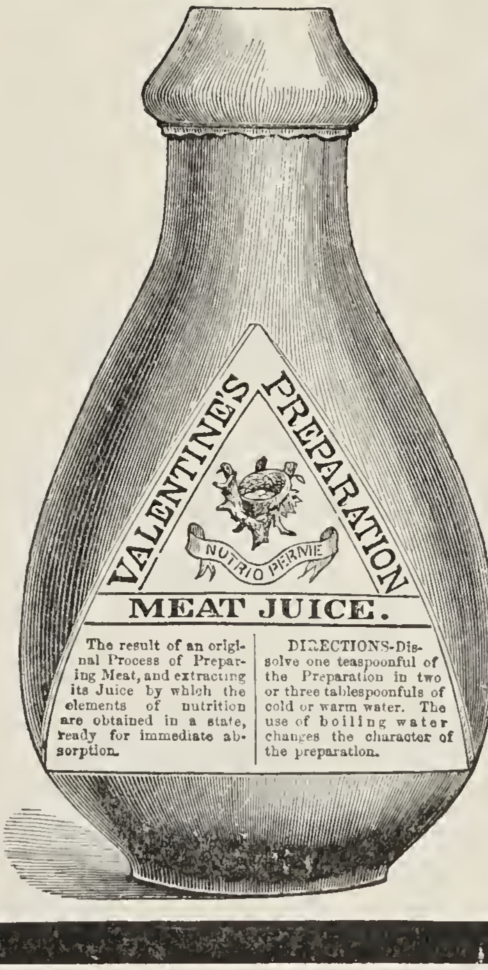
VALENTINE'S PREPARATION
NUTRIO PERMIE
MEAT JUICE.
The result of an original Process of Preparing Meat, and extracting its Juice by which the elements of nutrition are obtained in a state, ready for immediate absorption.
DIRECTIONS-Dissolve one teaspoonful of the Preparation in two or three tablespoonfuls of cold or warm water. The use of boiling water changes the character of the preparation.

Miscellany.

Painful Hypertrophy of the Breasts Cured by Oophorectomy.—Leriche (*Presse médicale,* May 5, 1923) reports the case of a woman of thirty-seven years whose breasts had been large and painful since the onset of menstruation at fourteen years. Menstruation was copious and prolonged. Of late the pain in the breasts had so increased as to prevent work and sleep. The organs were hard, with the lobules appearing as if injected with tallow, and a large tender node in the right axilla. An external discoid resection of both breasts by the submammary route was first performed, with little result. Three weeks later, injections of milk, previously found very effectual in Palet's cases, were given, without effect. Ten minutes' exposure to the mercury lamp at weekly intervals gave excellent results, but the effect was not maintained. Internal administration of mercury, iodide, and arsenic proved useless. After a year's fruitless treatment, menstruation becoming increasingly disturbing and palpation revealing diseased adnexa, celiotomy was carried out. Numerous adhesions were found between the sigmoid and two large tuboovarian cysts in which ovarian tissue was macroscopically absent. A subtotal hysterectomy was done. On the next day the breasts began to recede and the pain ceased. The breasts thereafter shrank further. The almost immediate reduction in size witnessed under milk injections or the mercury vapor lamp in some of these cases seems to show that the process is not a diffuse adenoma, but that abnormal vasomotor conditions constitute a major factor in it. The result obtained from oöphorectomy shows that the disorder, at least in some instances, originates in the reproductive organs.

A Statistical Study of Tuberculin Tests in Infancy and Early Childhood.—S. A. Wahl and H. J. Gerstenberger (*Archives of Pediatrics,* March, 1923) conclude that: 1. There is a slight increase of positive tests in the females over the males (sixty-one to fifty-four per cent.). 2. There is an increase in the percentage of positive reactions corresponding with the increase in age, being thirty-five per cent. in infants under six months of age, and eighty-seven per cent. in young children between three and four years of age. 3. Of different races and nationalities, the colored race gives the highest percentage of positive reactions. 4. Patients exposed to two or more sources of tuberculous infection showed a higher percentage of positive reactions than those exposed to only one. 5. When only one source of contact existed for a patient, the mother was found responsible for the highest percentage of positive reactions, a brother or sister for the next highest and the father for the lowest of the group. 6. Forty-four per cent. of the children giving positive tuberculin reactions gave a definite history of tuberculous contact, whereas, of those giving a negative history of exposure only fifteen per cent. reacted positively. 7. Scrofula gave the highest percentage of positive reactions and was followed by pulmonary tuberculosis, tuberculous adenitis, tuberculous osteomyelitis and pulmonary miliary tuberculosis. 8. By using the intracutaneous test, controlled by checking with a known case of tuberculosis, a higher percentage of positive reactions can be obtained, especially in cases of tuberculous meningitis and pulmonary miliary tuberculosis, than has been usually reported. 9. The intracutaneous tuberculin test, 0.1 c. c. of a one in one hundred solution, is in practically one hundred per cent. of the cases more sensitive in its reaction than the tuberculin tests performed either with the tattoo or the burr method; likewise, the test performed by the tattoo method is more sensitive than the burr, although the former is more difficult from a technical viewpoint. 10. The intracutaneous test with a one in a thousand solution has always been found positive even when stronger dilutions of one in ten and one in a hundred were used; the reactions with the stronger solutions have been in general more marked but the reaction with the one in a hundred dilution has been sufficient to convince the authors to choose it as their standard in performing the intracutaneous test.

Orthopedic Treatment of Rachitic Deformities.—Albert Wollenberg (*Deutsche medizinische Wochenschrift,* Nos. 17 and 18, 1922)) states that the following measures are necessary in the prevention and prophylaxis of rachitic deformities: The physical therapy should include passage, gymnastics (active and passive motions and motions against resistance), hyperemia (hot air baths, partial light baths and diathermy), radiotherapy (ultraviolet rays from the quartz lamp); regulation of the hygienic conditions, the diet and antirachitic medication (codliver oil) are valuable adjuncts. The adrenalin treatment has also been tired.

Arterial Pulse in Influenzal Pneumonia.—F. Leegaard (*Norsk Magazin for Laegevidenskaben,* August, 1922) contributes a study of the peripheral pulse of the carotis and radialis, drawing conclusions wherever possible as to the aortal curve. In the primary pulse wave of the author's cases of influenzal pneumonia, the curves are sharp and perpendicular as in acute febrile and infectious diseases, the sharp curve being more marked in the radialis curve than in the carotis pulse. This fact would suggest that the central pulse (the aortal pressure curve) would also show a slighter deviation of the primary wave, and lead to the conclusion that the sharp primary elevation of the arterial pulse must be of peripheral origin. In these cases the author feels he is confronted with a cardiectasis, extending to the arteries and capillaries, which is least noticeable in the large and medium arteries, and progressive toward the periphery. The tables show an increased incisure in both the carotid and radialis pulse, with a sharper curve in the former, probably due to peripheral conditions. The positive secondary elevation—the dicrotic—is also particularly marked in the radialis curve, and not so strongly developed in the carotid, which would suggest that the aortal pressure curve would likewise show but insignificant acceleration. The peripheral reflex must be considered as playing an important part.

The development of the incisure seems to depend on where the point of systolic end and diastolic beginning strikes the downward limb of the primary elevation. If this point is high up, a marked incisure is observed; as it descends the incisure diminishes, and becomes minimal in such cases where no point can be designated signifying the transition from systolic to diastolic, the pulse becoming monocrotic. In these cases the diastolic pressure is very low.

Constipation in Young Girls and Women—

especially those who spend much time indoors engaged in sedentary pursuits—is almost invariably attended by a retention of waste and toxic substances. Sooner or later these make their way from the bowel into the general system and give rise to a host of autotoxic ills.

Correction of this condition is imperative, and the safest, simplest and most effective remedy for the purpose is

INTEROL

a pure mineral oil of the proper density and viscosity to assure satisfactory lubrication of the intestinal canal, and thus relieve and correct bowel inactivity without the usual disagreeable effects of cathartics as commonly employed.

Besides lubricating the canal, INTEROL renders the feces soft and plastic, thereby promoting their easy passage and evacuation with gratifying freedom from discomfort and distress.

It would indeed be difficult to suggest any more serviceable and agreeable medium for the correction of constipation, with its attending autotoxemic conditions, than INTEROL.

Sample and Interol brochure on request.

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MANUFACTURERS OF ORASEPTINE—Internal and External Antiseptic, Wash, Spray and Douche.
ADACCO SALT—Effervescent Saline Laxative and Uric Acid Solvent.
VELOGEN—"The Doctor's Hand-maid and Household Emollient."

Directions:

To relieve the constipation of young girls and women, give two to four teaspoonfuls of INTEROL morning and night, increasing or decreasing the quantity as conditions require. As the bowels yield to the action of INTEROL, gradually cut down the dose to the least amount that—taken at bedtime—will assure a daily evacuation.

Palatability

In the administration of remedies, no factor, next to efficiency, is of greater importance than palatability. The psychological effect of a remedy is oftentimes as important as its physiological action.

ESKAY'S NEURO PHOSPHATES

furnishes not only a markedly effective form of the glycero-phosphates, but one that is particularly palatable. Patients do not tire of it on continued use, a paramount consideration in the treatment of neurasthenics.

SMITH, KLINE & FRENCH CO.
105-115 North 5th St., Philadelphia, Pa.
Established 1841
Manufacturers of *Eskay's Food*

Sputum in Necrotizing Influenza Pneumonia.—Erich Liebmann (*Schweizerische Medizinische Wochenschrift,* July 20, 1922) states that the necrotizing pneumonia may be recognized only by the changes found in the sputum, which are the following: Macroscopically, the sudden transition from a hemorrhagic to a purulent character, the rapid increase in the amount and the diminution in consistency; microscopically, the appearance of elastic fibres, the predominance of degenerated neutrophile leucocytes and the appearance of large macrophages, loaded with abundant cellular particles. Attention is also called to the significance of the macrophages as cleansing factors in the alveolar parenchyma of the lung.

Bacteriology of Ozena.—Kozo Sakagami (*Lancet,* January 6, 1923) recapitulates his experiments as follows: 1. The socalled ozena bacillus, obtained from the nasal passages of ozena patients, agrees in all important points with the coccobacillus of Perez. 2. The latter is to be found only in ozena patients and not in persons suffering from other nasal diseases and healthy persons. 3. Symptoms closely resembling those of human ozena were reproduced experimentally in rabbits. 4. In the various immune tests with the author's coccobacillus the serum of ozena patients generally showed a weak reaction; with some patients, however (those tending toward recovery), the specific reactions were remarkably strong. 5. It could be demonstrated that the serum from a rabbit immunized against the author's coccobacillus produces various immune bodies with great intensity. 6. In animal experiments with this bacillus the presence of immune bodies in the serum was clearly demonstrable; on the other hand, the reactions of the serum of most patients were rather weak. This can be explained from the nature of the disease, which causes merely local changes, so that in the general circulation the antibodies appear only in small quantities. 7. From these experiments it appears that the author's coccobacillus may confidently be considered to be the causative agent of ozena.

Displacement of Peripheral Infiltrations Toward the Serous Cavities in Cirrhosis, Bright's Disease, and Heart Disease.—A. Lemierre and J. Lévesque (*Presse médicale,* May 2, 1923) discuss the factors other than gravity which influences the distribution of adematous fluid and serous effusions in these disorders. Potain, Huchard, and others long since taught that in cardiac cases transudations into the pleural or peritoneal cavities formed a kind of peripheral barrage or dam which hindered the action of digitalis and the removal of which by puncture was often followed by the onset of diuresis under this drug. The authors describe cases showing that these cavities at times actually attract serous accumulations in heart insufficiency or renal impermeability, and that paracentesis in such cases induces a mobilization of edema fluid and its return into the blood circulation by making use of the attraction for water and chlorides exerted by the serous membranes—generally diseased—which is greater than that exerted in the subcutaneous cellular tissues. For this reason the appearance of ascites or pleurisy in some cases of cardiac decompensation or nephritis with edema, refractory to heart tonics and diuretics, is a salutary complication, provided the observer takes care to avail himself of it by puncturing. By combining a salt free diet with repeated punctures, one may bring about not only temporary clinical improvement but a considerable prolongation of life, even where an early fatal termination had been expected. This procedure, when available, is certainly preferable to the measures for direct evacuation, such as blistering and Southey's tubes. As much puncturing as possible should be done before giving digitalis or theobromine. As long as serous effusions persist in any given case, the physician retains much power to reduce suffering and prolong life.

Experiences With Splanchnic Anesthesia.—Ernst Kutscha-Lissberg (*Wiener klinische Wochenschrift,* March 22, 1923) finds that, with practice, splanchnic anesthesia fails very rarely, but that complete anesthesia is not always accomplished even with practice. The surroundings of the splanchnic nerve seem to entail greater dangers than other regions. Not only an undesirably rapid resorption and resulting intoxication, but also an occasional prompt reflex collapse may occur and even secondary injuries in the sense of an atony of the stomach and intestine. Atropin, at least in a single injection, does not eliminate these injuries with certainty, but it does seem to render such occurrences to occur less frequently. Patients who show a labile balance relationship between the sympathetic and vagus nerves are endangered by splanchnic anesthesia. Future work along these lines must be directed toward eliminating these gross variations between the sympathetic and the vagus nerves.

Mass Treatment of Hookworm Infection.—K. S. Mhaskar (*Indian Medical Gazette,* June, 1922) treated 1,600 cases with thymol, 900 with betanaphthol, and 2,200 with chenopodium oil. His conclusions are that the chenopodium treatment is efficient, but toilsome, costly, and uncertain as to safety, while both thymol and betanaphthol treatments are efficient, simple and safe, one treatment being enough to reduce ninety-three per cent. of hookworm infection. Both thymol and betanaphthol are good anthelmintics possessing vermicidal and vermifugal properties. The maximum dose of each if fifty grains mixed with twenty-five grains of light magnesium carbonate, given without a purgative, and only one treatment is needed. The choice between the two drugs seems to be dependent on the price of each and thymol is very much cheaper in India.

Treatment of Laryngeal Diphtheria by Suction.—R. W. Grover and R. P. Hardman (*Archives of Pediatrics,* March, 1923) endeavored to lessen the number of cases needing intubation, and thereby lessen the mortality, by removing the membrane in laryngeal diphtheria by suction. The results are encouraging. The method used is by direct laryngoscopy, Boyce position, using either specially made metal tubes or silk elastic catheters and a motor driven suction pump. The danger of a false passage is exceedingly small, provided that the tube is introduced under ocular guidance when the larynx is open during inspiration. The entire procedure ordinarily takes only a few minutes and in the majority of cases the relief is immediate and marked. This treatment will not always obviate intubation or tracheotomy, but it will markedly lessen the number of cases requiring them and lessen the mortality.

Convalescence

following the acute infections, such as **influenza, pneumonia, bronchitis, diphtheria, scarlet fever and measles, as well as after surgical operations, child birth,** and so on, is rapidly promoted and hastened by the systematic use of

Gray's Glycerine Tonic Comp.

Two to four teaspoonfuls, three or four times a day, stimulate the appetite and aid digestion, thus increasing food assimilation and building up in natural ways, the vitality and strength of the body.

Thousands of busy practitioners turn to Gray's Glycerine Tonic Comp. whenever a restorative or reconstructive is needed, because their experience has shown them that it can be relied on to produce the results they seek.

Dysmenorrhea

is one of the most common and intractable affections that tax the skill of the practitioner. Fortunately, in

Hyperol

the practicing physician has a remedy that, owing its beneficial action to its regulation of the utero-ovarian circulation, promptly reduces the local congestion and thus effects an early relief from pain. Not the least, therefore, of the notable advantages of Hyperol, is the way it obviates, in the great majority of cases, any necessity for opiates or narcotic drugs, with their all too evident dangers.

But it is through its restoration of normal functions of the uterus and ovaries that Hyperol accomplishes its greatest benefits, for it thus enables medical men to produce results in **amenorrhea, dysmenorrhea, subinvolution and kindred** ills that are possible with few other remedies.

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In **Typhoid, Gastric** and **Other Fevers,** where it is **Essential** to **Sustain** the **Patient** without **Irritating** the **Weakened Digestive Organs, Valentine's Meat-Juice** demonstrates its **Ease** of **Assimilation** and **Power** of **Restoring** and **Strengthening** when **Other Food Fails.**

J. R. Wood, M. D., *Physician Sheltering Arms Hospital, Paint Creek, W. Va., U. S. A.:* "I have been using VALENTINE'S MEAT-JUICE in the treatment of Typhoid Fever cases in the Sheltering Arms Hospital, for the last two or three weeks, with the most gratifying results both to the patient and physician. I consider it the best preparation of animal food I have ever seen, in fact, the only one I have ever had any success with."

Dr. Genevaix, *Assistant Surgeon-Major, First Class, Hotel Dieu, Creusot, France:* "The patients to whom I have given the excellent preparation, VALENTINE'S MEAT-JUICE, have found their general condition rapidly improved by it, and in the convalescence from continued Fever (Typhoid and Para-Typhoid) it gives the best results."

Physicians are invited to send for brochures containing clinical reports.

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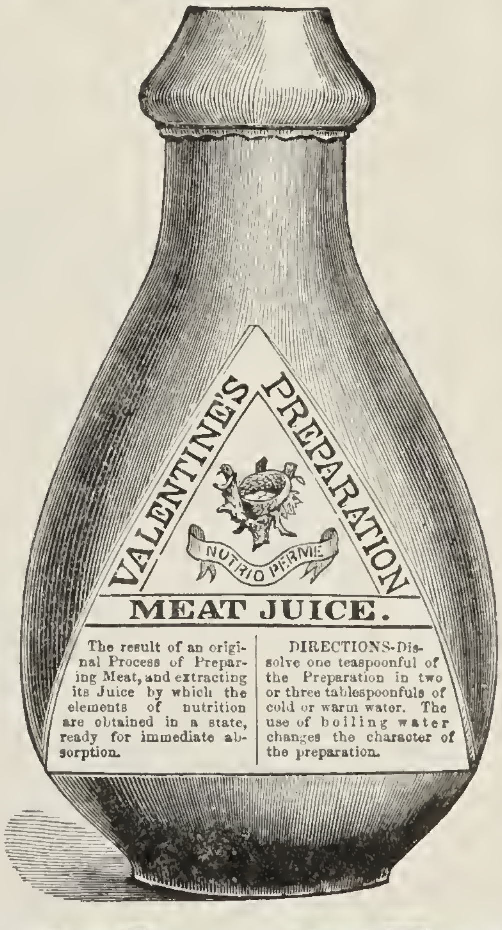

The result of an original Process of Preparing Meat, and extracting its Juice by which the elements of nutrition are obtained in a state, ready for immediate absorption.

DIRECTIONS-Dissolve one teaspoonful of the Preparation in two or three tablespoonfuls of cold or warm water. The use of boiling water changes the character of the preparation.

Miscellany.

What Conclusions May Be Drawn From the Demonstration of Colon Bacilli in the Stomach of Infants?—W. Grävinghoff (*Monatsschrift für Kinderheilkunde,* March, 1923) finds that bacteria of the colonlactis aerogenes group occur in a considerable number of stomachs of infants, which finding is a valuable support of the theory that the presence of colon bacilli in the stomach and duodenum is the usual associated finding in disturbances of the gastrointestinal canal. It is still a question whether they are the necessary prerequisite for the development of these disturbances.

Colon Bacillus Agglutinins.—Eugen Kramar (*Monatsschrift für Kinderheilkunde,* March, 1923) found that only five marked agglutinin values occurred among twenty infants that were inoculated. Infants less than one month old remained almost completely refractory. The ability to develop colon bacillus agglutinins is, therefore, only very moderately developed in infants, particularly in those less than one month old.

Studies on the Tuberculin Reaction and on Specific Hypersensitiveness in Bacterial Infection.—Hans Zinsser (*Journal of Experimental Medicine,* November, 1921) in summarizing his investigations states that the following points seem incontrovertible on the basis of his experiments, as well as those of other workers: 1. Two fundamentally different types of intradermal reactions may be observed in the guineapig. They are the immediate, transitory reaction, and the tuberculin type of skin reaction. The first is that which develops in animals sensitized against proteins (horse serum, etc.), and may be regarded as one of the manifestations of general hypersensitiveness or anaphylaxis; the second develops more slowly, leads to a more profound injury of the tissues, and is independent of anaphylaxis as commonly conceived. 2. The tuberculin type of hypersensitiveness (and also probably the typhoidin, mallein, abortin reactions, etc.) do not develop at all in guineapigs sensitized with proteins, such as horse serum. While this form of hypersensitiveness may eventually be induced with materials not bacterial in origin, it has been observed so far only as a reaction of bacterial infection. 3. Methods of treatment with protein material from bacterial cultures which sensitize guineapigs to anaphylactic reactions with the bacterial extracts, do not sensitize them to the tuberculin type of reaction. Such sensitization is easily accomplished only by infecting the animals with living organisms. No reliable method of sensitizing guineapigs to such reactions with dead bacterial material has as yet been worked out, though a few hopeful experiments have been obtained with massive injections of large amounts of the acid precipitable substances (nucleoproteins?) from bacterial extracts. 4. In animals made hypersensitive to the tuberculin type of reaction by infection with living bacteria, the reaction may be elicited by intradermal injections of bacterial extracts from which all coagulable proteins, nucleoproteins, and Bence-Jones proteins have been removed as well, as this can be done by boiling with acid, etc. This proteose residue alone suffices to elicit such reactions. The exact chemical nature of the socalled proteose residue must be further studied and analysed. Zinsser then presents a number of theoretical considerations which the experiments suggest, and states that if the deductions he makes have any value, the attention of bacteriologists should be turned to the nonprotein constituent of bacterial cells in their further immunological studies, as well as to the protein materials.

The Hydrogen Ion Concentration of the Blood in Carcinoma. I. From the Colorimetric Determination of the Blood Dialysate.—William H. Chambers (*Journal of Biological Chemistry,* February,1923) determined the hydrogen ion concentration of the dialysate from the venous blood in forty-five cases of carcinoma. At 20° C. it averaged 7.45, which was slightly more alkaline than that of normal subjects, 7.31. In general, the degree of alkalinity corresponded to the size and extent of the tumor growth, small growths without metastases showing little or no increase above the normal.

The Influence of the Sodium Ion in the Production of Tetany.—Frederick F. Tisdall (*The Journal of Biological Chemistry,* September, 1922) injected dibasic sodium phosphate and phosphoric acid into dogs intravenously, the time required for each injection being about one hour. The injection of the dibasic sodium phosphate caused twitching in all four dogs, although a condition resembling active tetany occurred in only one of them. After the injection of phosphoric acid no signs of increased irritability appeared. It is concluded that the sodium-calcium ratio is the important factor in the production of tetany, excepting the gastric type, and that the calcium-phosphorus ratio has no influence on the production of tetany. Gastric tetany is probably due to an increase of the bicarbonate ion, and not to a disturbance of the sodium-calcium ratio.

Action of Drugs on Respiration. I. The Morphine Series. Carl F. Schmidt and W. Benson Harer (*The Journal of Experimental Medicine,* January, 1923) performed the work described in order to ascertain whether drugs which are known to depress cough selectively have a more marked action on expiration than on inspiration. The cat was used for their experiments. Morphine and heroine were found to exert a selective depressant action on the central expiratory mechanism without producing narcosis, and often without depressing inspiration. Codeine had no constant effect except stimulation of the spinal cord.

Agglutinations of Dysentery Bacilli in Children.—Paul Widowitz (*Wiener klinische Wochenschrift,* March 22, 1923) concludes: 1. The formation of agglutinins against dysentery (Flexner-Y) assumes the presence of a dysentery infection, so that the socalled normal agglutinins should be considered to be a specific residual immune agglutinin. 2. The original infection, which in many cases of endemic dysentery affects children during the first year of life, leads to diminished agglutinating values, which are increased in their titre values by superinfection. 3. By the time that puberty has passed, most of the individuals have gone through an infection with this disease. Just as in tuberculosis, infection and disease should be differentiated. 4. The coagglutinins also presume the presence of an infection with the homologous bacterium.

In recommending an infant food
—consider its nutritive value first

Cleanliness, digestibility, and palatability are also of importance, but without nutritive value any food would be useless as a body builder.

FOR the infant, breast milk furnishes all of the requirements mentioned. There is no need to seek further for a better food because no one has as yet been able to prepare a formula which can be considered anything other than a second choice.

As a breast milk substitute there is no better food for the infant than Eagle Brand Milk. For more than four years the largest child-feeding clinic in the history of the world has been maintained in the Near East, and Eagle Brand Milk has met every requirement for a complete milk food for the infants and older children throughout this period.

Reprints of clinical experiments with sweetened condensed milk will be sent upon request.

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Palatable Well-Tolerated Reliable

Allaying Restlessness and Producing Refreshing Sleep

Especially indicated in insomnia from mental strain, neurasthenia and other neuroses; also an excellent sedative in sea-sickness.

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Request*

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NEW YORK

Influenzalike Bacilli.—T. M. Rivers (*Bulletin of the Johns Hopkins Hospital,* December, 1922) describes two influenzalike bacilli requiring the addition of only an autoclave-labile substance as an accessory food factor. For this group of organisms the name Bacillus parainfluenzæ or Hemophilus parainfluenzæ is suggested.

Observations on the Production of Toxic Substances by Pneumococci.—Alan M. Chesney and Alfred B. Hodges (*Bulletin of the Johns Hopkins Hospital,* December, 1922) discuss the relationship of the toxic substances obtained from pneumococci by solution of the bacterial cell or by manipulation of pneumonic exudates to the phenomena of intoxication in pneumonia in man. In no instance were any toxic effects observed in the mice injected intraperitoneally with filtrates of actively growing cultures of pneumoncocci in beef infusion broth, normal human serum and defibrinated normal human blood.

Loss of Circulating Erythrocytes in Certain Types of Experimental Pneumonia.—Chauncey D. Leake and Thomas K. Brown (*Journal of Experimental Medicine,* December, 1922) found a marked decrease in red cell counts of dogs with experimental pneumonia. The blood volume remaining constant, the hemoglobin fell in proportion to the fall in the number of red cells, and there was a marked increase in plasma with a corresponding fall in the mass of formed elements. Thus there appears to be an actual loss of erythrocytes in the effective circulation without a compensatory regeneration. Postmortem examination of the tissues of various organs showed the red cells in different stages of degeneration in the capillaries and tissue spaces of the lungs, liver, spleen and intestinal wall.

Microchemical Demonstration of Hydrocyanic Acid in Poisonings.—H. Brunswik and F. Neureiter (*Wiener klinische Wochenschrift,* July 13, 1922) report that the microchemical reaction for hydrocyanic acid which has been used to determine the presence of the hydrocyanic acid in vegetable matter can also be applied in medicolegal matters. The hydrocyanic acid is released by the addition of oxalic acid at room temperature and is used as an indicator with silver nitrate. Characteristic crystals of silver cyanate occur, which color "true" in the presence of methylene blue. With the aid of recrystallization, the crystals may be positively identified.

The Action of Drugs on Respiration.—Carl F. Schmidt and W. Benson Harer (*The Journal of Experimental Medicine,* January, 1923) report that with all the drugs tested—ether, chloroform, hydrated chloral, urethane, magnesium, and luminal—there occurred a more or less selective depression of expiration, as with morphine and heroine, but narcotic doses were required to produce any effect, and inspiration was always definitely depressed; expiration was weakened, but did not become passive until very marked depression of inspiration appeared. The effect of these various drugs is described. Caffeine and strychnine, whenever they caused acceleration after morphine, brought back active expiration. Atropine never stimulated, and commonly acted as a synergist to morphine. The authors suggest that the results outlined here and in the previous paper point to the existence of a separate central mechanism for the control of each of the phases of respiration, and that, while each responds to the same chemical stimuli, the threshold of the expiratory is higher than that of the inspiratory. Evidence is presented to indicate that if expiration remains passive a marked increase in depth of breathing may slow the rate, and a respiratory mechanism that lacks active expiration may be so inefficient that a CO_2 concentration which stimulated when expiration was active may depress when it is passive.

Spontaneous Pneumothorax in Infancy.—Bruno Schönfeldt (*Monatsschrift für Kinderheilkunde,* December, 1922) observed six cases of grippe pneumonia in children, ranging from seven months to four years of age. Spontaneous pneumothorax resulted in four cases (all fatal) and mediastinal and skin emphysema resulted twice (one fatality). The pneumothorax was produced twice as the result of rupture of the abscess into the pleural cavity, once as a result of the rupture of an emphysematous air space; the mediastinal emphysema was produced once as the result of the perforation of a bronchus lying in tuberculous infiltrated tissue. In one case of pneumothorax, emphysema could be made only with röntgenography.

Residual Nitrogen Values in Diphtheria and the Effect of Antidiphtheric Serum Upon the Disease.—Grete Glesinger-Reischer and Bernhard Glesinger (*Wiener klinische Wochenschrift,* March 8, 1923) found that as a rule a moderately increased residual nitrogen underwent a rapid diminution in about half the cases of diphtheria after a successful treatment with serum. On the other hand, a complication, such as, for example, scarlet fever or tonsillar abscess, or an incomplete effect upon the disease process from serum (persistence, of the fever and of the membrane) diminishes the reduction of the residual nitrogen and even causes an additional increase.

Rheumatoid Arthritis Treated With Intravenous Bacillus Coli Vaccine.—Rowland J. Perkins and G. Bruce White (*British Medical Journal,* March 10, 1923) assert that the intravenous use of Bacillus coli vaccine does appear to have a definite value, especially as an adjuvant to the more recognized methods of treatment. It is still too early to state whether any benefits that may have resulted are permanent. They consider this form of treatment to be indicated under the following conditions: 1, cases in which no definite focus of infection can be located; 2, cases in which the more recognized methods have failed; 3, early cases in which the process in the joints is still active, especially if swelling and effusion are present. Little can be hoped for when adhesions are present in the joints. A great difficulty in the execution of the treatment is the estimation of the proper dose of vaccine so as to produce a beneficial reaction which would not be too severe for the patient. The initial dose should be as large as possible. The reaction consists of a rise of temperature a few hours after the injection, frequently associated with a chill. Nausea and vomiting may also occur. The reaction usually lasts from twelve hours to two days. If improvement occurs at all it occurs usually within two days. The best results were observed in those cases which showed the severe reactions.

"When Winter Comes"

—a great many patients—especially the weak and debilitated—need to be fortified against the depressing effects of cold weather, and for this purpose probably no remedy is more widely employed by physicians of experience than

Gray's Glycerine Tonic Comp.

If its use is started early, as soon as the chilly days of Fall begin, this tonic reconstructive will, in the great majority of cases, promptly raise the functional activity of vital organs, and as a logical sequence, produce a marked gain in the defensive powers of the body against germ attack. Gray's Glycerine Tonic Comp. will thus enable the practitioner to carry many a patient through the Winter with gratifying freedom from the colds, coughs and catarrhal affections in general, that make this period so trying and dangerous to those susceptible to the acute infections.

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Whenever the **Stomach** from any cause **Rejects Food** or **Medicine, Valentine's Meat-Juice** demonstrates its **Ease** of **Assimilation** and **Power** to **Restore** and **Strengthen.** In the **General Debility** with **Impaired Digestion** of **Phthisis,** and in the **Depressing Prostration** following **Influenza** it is recommended by many practitioners throughout the world as invaluable in their treatment.

Phthisis.

J. Mertens, M. D., *A. T. O. Bristol Municipal Tuberculosis Dispensaries, Bristol, England:* "I am pleased to state that the results obtained from VALENTINE'S MEAT-JUICE were very satisfactory indeed in all cases where no other kind of food could be used. It produced excellent results with wounded soldiers suffering from Tuberculosis of the lungs."

Dr. Gouel, *Physician in Chief Villepinte Hospital for Consumption, Paris, France:* "VALENTINE'S MEAT-JUICE succeeds well in cases of Anæmia and in the treatment of Tuberculosis in an advanced stage when the stomach is intolerant."

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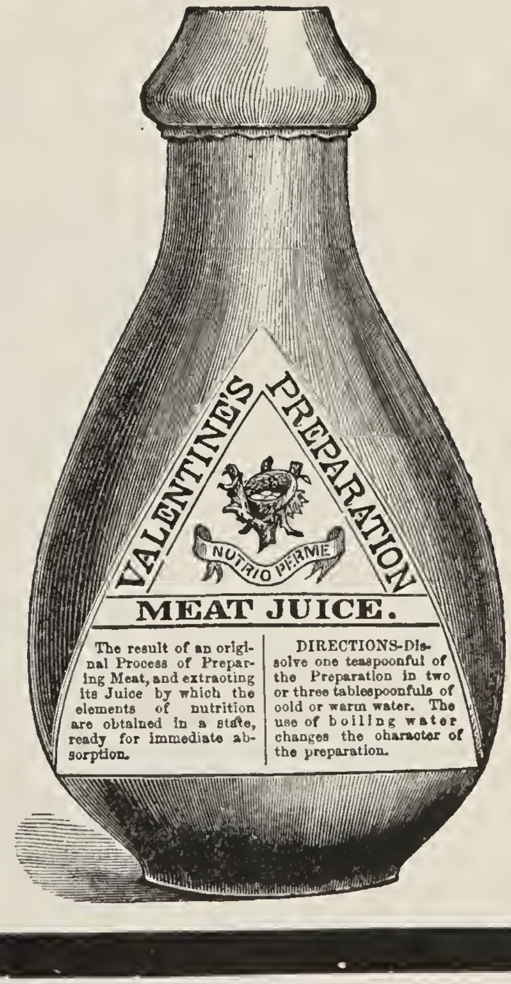

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MISCELLANY.

Ether Oil Rectal Anesthesia to Produce Twilight Sleep.—H. Thaler and R. Hübel (*Zentralblatt für Gynäkologie,* March 3, 1923) were enabled to produce a condition resembling twilight sleep in pregnant women with the use of a slow rectal administration of one hundred c. c. of a freshly prepared ether oil mixture (ninety gm. pure sulphuric anesthetic ether and 120 gm. of the purest olive oil), which condition was particularly characterized by postpartum amnesia. States of excitation, such as are produced by scopolamine anesthesia, were never observed. The intestine showed absolutely no irritative conditions. Among one hundred observations, the course of the labor was normal eighty times and slightly weakened twenty times. Only two infants showed typical asphyxia, one of which died. This form of anesthesia should be used only in hospitals.

Inflammatory Adnexal Tumors as a Complication of Pregnancy.—George Richter (*Zentralblatt für Gynäkologie,* March 10, 1923) shows that active intervention as early as possible is necessary in every case of inflammatory tumor complicating pregnancy. Even though the pregnancy is far advanced, operation on the adnexa in pregnancy is generally well borne and the pregnancy need not necessarily be interrupted as a result of the operation. However, even if the pregnancy is interrupted, such an occurrence would be less dangerous than abortion in the presence of an infection. Laparotomy is nearly always necessary, the vaginal route may be employed in cases of abscesses and pyosalpinx accessible from the posterior fornix, but the danger of ascending intrauterine infection and sepsis is imminent. The extirpation of the pregnant uterus, together with the tumor, leaving intact, if possible, the ovary on the opposite side, the author regards as the method of choice. Mere extirpation of the infected adnexa containing pus may be dangerous.

Active Rotation of Fetus After Version From the Dorsoposterior Transverse Presentation.—In those severe cases, in which with dorsoposterior transverse presentation the anterior foot cannot be grasped, but one must be satisfied in grasping either foot of the fetus, and in cases in which the lower foot has been chosen instead of the upper foot and the sacrum has lodged behind the symphysis with the attempt at extraction, Friedrich Heinlein (*Zentralblatt für Gynäkologie,* March 10, 1923) calls attention to the fact that the textbooks recommend that under such conditions extraction should not be proceeded with immediately, but a labor pain should be awaited or should be replaced by pressure from without, so that the extremity lying posteriorly should turn toward the front spontaneously. In the cases in which such a turning does not occur the author was repeatedly enabled to accomplish the turn by traction on the leg laterally and anteriorly; but the traction and the turning must be done simultaneously, so that the femur is not fractured. The direction of the turning must be the same as that toward which the toes of the fetus point. The back then travels posteriorly, but only transiently and glides past the promontory. In this respect there need be no fear of the version of the fetal back posteriorly.

The Widal (Hemoclastic Crisis) Functional Liver Test in Pregnancy.—G. Kaboth (*Zentralblatt für Gynäkologie,* November 25, 1922) found that the Widal functional liver test is not applicable as a test of pregnancy. The hemoclastic crisis certainly appears much more frequently in pregnancy than in normal persons, but the test also results positively in infectious diseases, inflammations of the adnexa, appendicitis, after chloroform and ether anesthesias, which renders this test unfit as a test of pregnancy.

Puerperal Occlusion of Mesenteric Vessels and the Etiology of Common Thrombosis.—Bucura (*Wiener klinische Wochenschrift,* November 23, 1922) states that the thrombosis of the superior mesenteric artery is extremely rare in the puerperium. The author does not believe in the etiological effect of the retardation of the blood stream, which is generally assumed at the present time. He asserts that this may favor the increase in size of the thrombus, but for its origin there must be present a hypothetical change in the vessel wall (possibly also a change in the blood), as a result of which the circulating toxins enter the organism during pregnancy. It is for this reason that exercises in the bed, early leaving the bed, etc., cannot prevent the formation of thromboses. An attempt should be made to paralyze the toxic effect by early prophylactic measures, for which purpose proteotherapy, vaccinotherapy, the administration of endocrine extracts, the regulation of the intestinal activity and of the renal function, sweating procedures, etc., may be used. If possible, mesenteric thrombosis should be attacked surgically.

Influence of the Treatment of Syphilitic Pregnant Women Upon the Incidence of Congenital Syphilis.—J. Whitridge Williams (*Bulletin of the Johns Hopkins Hospital,* November, 1922) analyzed 113 pregnancies occurring in ninety-six women during two years, nine of which ended in abortion and six in premature labor, all the latter patients dying. The treatment of the women was classified under five heads, groups A to C being composed of those women who received sufficient treatment, so that the Wassermann reaction remained negative for one year in the first class, and three months in the third class, after the cessation of the last treatment; Group D comprised those in whom the Wassermann became negative only shortly before the birth of the child, and Group E, all those in whom the treatment was notoriously insufficient. Of the ninety-eight children, four died from accidents of labor. The remaining children were followed and notes made on their condition from four to twenty-eight months after birth. The results showed that of the ninety-four children who were born alive five, or 5.3 per cent., showed demonstrable evidence of syphilis, while seventy-six were living and well, nine had been lost track of, and four had died. This study indicates that almost ideal results follow anything like efficient treatment of syphilitic pregnant women, and that surprising results sometimes follow what would be ordinarily considered altogether inefficient treatment in men or nonpregnant women, which would seem to indicate the pregnant women are usually amenable to antisyphilitic treatment.

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A New Method of Inducing Labor Pains.—Paul Klein (*Zentralblatt für Gynäkologie,* August 12, 1922) observed that strong labor pains usually set in after the repeated rectal examination of pregnant women. This reaction he attributes to the stimulation of the Frankenhäuser ganglia and he utilized this in a practical manner in the treatment of weak labor pains. A rubber balloon is placed in the rectum and filled with 100 to 250 c. c. of water. This procedure he calls procteurysis; it is just as reliable as colpeurysis. It is absolutely painless and harmless and is easily borne by the pregnant woman. Its chief advantages are: 1, the rapid development of powerful labor pains, which recur at regular intervals; 2, a rapid disappearance of the vaginal portion of the cervix, owing to the effect of the pressure and its special applicability in primiparæ; 3, the extragenital introduction of the balloon, thereby preventing the introduction of infection into the genital tract or an ascent of the germs into the genital tract alongside of the balloon; 4, the promotion of the flow of the secretion outward, as a result of the stretching of the posterior vaginal wall and of the posterior fornix becoming shallow; 5, the easy technic—the balloon, fluid and the physician's hands need not be sterile; 6, the sparing of the balloon because it need not be boiled before each introduction; 7, spontaneous micturition is possible.

Indications in the Treatment of Febrile Abortion From the Bacteriological Viewpoint.—W. Sigwart (*Zentralblatt für Gynäkologie,* September 23, 1922) asserts that the bacteriological investigation of the secretions from the uterus will never give decisive information upon which the therapeutic measures may be based until we have learned to differentiate absolutely between virulent and avirulent streptococci. The fact that the streptococci found in any secretion produce hemolysis is immaterial as regards methods of treatment.

Value of Blood Pressure Determinations in the Renal Disturbances of Pregnancy and Labor.—W. Gessner (*Zentralblatt für Gynäkologie,* October 28, 1922) states that a fall of the blood pressure in the puerperium is the result of toxins, that it is an important sign in prognosis, and that it acts as a danger signal for the institution of supportive treatment for the heart and vascular system. A rise in the blood pressure in pregnancy, on the other hand, is produced not only by injury of the kidneys, but, according to the author, by a simple increase in the intraabdominal pressure as a result of the enlargement of the uterus; such an increase in blood pressure may exist with a kidney of pregnancy.

Wassermann and Meinicke Reactions in Carcinoma of the Uterus.—Robert Niedermayr (*Wiener klinische Wochenschrift,* January 4, 1923) found one cachectic case with a positive Meinicke reaction and a weakly positive Wassermann test with inactivated serum among twenty-five cases of carcinoma of the uterus; one case revealed a positive reaction after röntgen irradiation. He concludes that these two tests cannot be utilized with any certainty in the differential diagnosis between uterine hemorrhages of a syphilitic or carcinomatous nature. These tests are not positive more often in advanced carcinoma, recurrences, and after intensive röntgen irradiations, in which cases a marked blood toxicosis has resulted from resorption of carcinomatous tissue, as would naturally be expected. There are even cases, in which the slight reaction present previously to the irradiation has entirely disappeared after it. Owing to the scarcity of such cases, the determination whether the appearance of the reaction after the irradiation is due to the irradiation or other causes (advancing cachexia?) is difficult.

Proposals for the Protection of the Ovaries During Postoperative Irradiation.—Walter Offermann (*Zentralblatt für Gynäkologie,* April 21, 1923) asserts that during postoperative irradiation after the extirpation of a cancer of the uterus insufficient attention is paid to the function of the ovaries and as a result the ovaries are destroyed. After vaginal or abdominal hysterectomy for a malignant growth the author recommends cutting the ovary into discs from one to two millimetres thick and inserting them singly at various points between the rectus muscle and its anterior sheath. The area just above the umbilicus is the best, as a wide area is thus left free for irradiation. The ovaries are safely protected from the effects of the irradiation and can then be protected by lead plates. This procedure will guarantee the continuance of ovarian function for a period of three to five years, until the body is able to become accustomed to the loss of the ovarian function. Mild symptoms of loss of ovarian function usually appear for three or four months after the operation until the transplanted ovary becomes established in its new location. Another procedure is to transplant one ovary and leave the other in place.

Rodent Ulcer of the Vulva.—Friedrich Jess (*Zentralblatt für Gynäkologie,* March 31, 1923) states that the differential diagnosis between rodent ulcer and soft and hard chancre and tuberculous and carcinomatous affections can be definitely established only by a process of exclusion. Contrary to the prevailing opinion, it can be treated not only surgically but also conservatively. A case is reported in which general treatment with iron and arsenic, as well as cauterization with carbolic acid, silver nitrate and tincture of iodine, produced a cure within six months. Special emphasis is attached to the general condition of the patient and the general treatment. Individuals in a reduced and poorly nourished condition, especially those suffering from consuming diseases, are peculiarly predisposed to obstinate, nonspecific ulcerations on the external skin and the external genitals. Such individuals should be subjected to operation only when intensive and long continued general treatment and the healing of any other disabling condition present have made them fit for operation.

Treatment of Puerperal Infections.—B. P. Watson (*British Medical Journal,* March 24, 1923) believes that curettage or any intrauterine manipulation should never be done in a case of abortion showing a rise of temperature, except in the presence of severe hemorrhage. If in incomplete abortion a mass is felt blocking the cervical canal, nothing more should be done than to remove it carefully. A gentle curettage may be done after the temperature has subsided to normal for several days, if the bleeding persists and if the cervix remains patulous. Even then there may be evidence of a blood invasion, as shown by a rise of temperature after the operation and occasionally by a chill.

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MISCELLANY.

Gangrenous Dermatitis Following Appendectomy.—Marshall Clinton (*Bulletin of Buffalo General Hospital,* April, 1923) reports a unique complication in abdominal surgery. Following the removal of a gangrenous appendix, which was walled off as usual, there developed a rapidly progressive necrotizing process affecting all the layers of the skin and involving in a short period almost the entire abdominal wall. Associated with this there was a considerable constitutional reaction which threatened the life of the patient. The process lasted five weeks before any signs of abatement set in. There was little proof that the process was due to infection despite the several varieties of bacteria that were isolated. The infection of the laparotomy wound could very well have been secondary to a beginning necrosis of the skin in that locality. Other possibilities of causation are local circulatory disturbances —embolic, thrombotic, or endarteritic—for none of which there was any evidence. Nor was there any evidence of a neurotic skin gangrene. On the other hand, it is difficult to regard the appendectomy as a mere coincidence. There need not, however, be a direct infection but perhaps some mechanical effect upon the local circulation, or, possibly, some traumatic, infectious or toxic effect upon the nerve supply, with a resulting neuritis and trophic disturbance in the skin of that region.

Effect of Fat Upon the Assimilation of Sugar. Kozo Sakaguchi, Osamu Asakawa and Satosu Nakagawa (*Mitteilungen aus der Medizinischen Fakultät zu Tokyo,* Band xxix, Heft 2) report: 1. That both in the nondiabetic as in the slightly diabetic individuals the hyperglycemia, which occurs after the ingestion of a carbohydrate diet, is more or less diminished by the abundant addition of fat, although the effect is often insignificant. Accordingly the glycosuria under such conditions is frequently observed to be somewhat less than without the addition of fat. This reduction of the glycosuria by the fat varies in strength in different cases. At any rate the addition of fat in slight diabetes has no injurious action on the glycosuria, as long as a carbohydrate diet is consumed. However, in patients with intestinal catarrh, the fat, in addition to the aggravation of the diarrhea, may also reduce the assimilation of sugar. 2. If sufficient fat is added to a strict diet in a severe case of diabetes, the increase in the glycosuria appears to occur in every case. 3. The injurious effect of the fat upon the tolerance, as well as upon the acidosis, varies with the addition of like amounts of fat: the "sensibility to fat" varies in individuals. 4. Although the increase in glycosuria occurs usually only with large additions of fat, nevertheless the "sensibility to fat" often appears to occur even with such amounts of fat as are used in the practical treatment. 5. The injury to the tolerance by the administration of fat is always associated with a distinct increase in the acidosis and both seem to stand in an intimate relationship. The continued injury to the tolerance appears only in the cases in which the acidosis rises continuously by the administration of fat. Where the originally increased acidosis begins to diminish after a few days on the continuation of the same diet, the tolerance is injured only for a short time and may even be absent entirely. 6. The appearance of sensibility to fat seems to depend upon the fact that the increase in acidosis as a result of the administration of fat also injures the assimilation of sugar. 7. Inasmuch as the diminution of the tolerance occurs only with the administration of large amounts of fat and with an increased acidosis, the injury of the tolerance in most of the cases may be avoided by regulating the administration of fat according to the finding of the acidosis, as is usually done today. Also in cases, in which the increase in glycosuria is observed as a result of the administration of fat, it is proper to determine first the lower limit of the injurious amounts of fat in a particular case and then to limit the administration of fat to such an extent that it does not overstep these bounds. A marked restriction of the fat does not appear to be justified.

Two Cases of Idiopathic Type of Osteopsathyrosis Associated with Congenital Syphilis.—Prescott Le Breton (*Bulletin of Buffalo General Hospital,* April, 1923) presents two cases showing a combination of congenital syphilis with changes in the osseous system corresponding in its most important features with idiopathic osteopsathyrosis. As regards the relation of the two conditions to each other, it will hardly be determined on clinical evidence alone. Generally, syphilis is denied any causative rôle in osteogenesis imperfecta or osteopsathyrosis, although cases of possible syphilitic origin have been reported. However, since so little is known regarding the etiology of osteopsathyrosis, it may be possible that it is not due to one sole cause but that several different agencies including syphilis are capable of producing similar bone lesions. This is especially true since the cause or causes may only be operative through the endocrine system, as has often been postulated.

Should a Suppurative Adnexal Tumor Be Operated Upon or Not?—George Katz (*Zentralblatt für Gynäkologie,* June 10, 1922) asserts that the modern view as to whether suppurative adnexal inflammations should be treated conservatively cannot be precisely stated, although the differences of opinion on this subject are not so divergent as formerly, which is partly due to the modern improvements in surgical technic. As a result of successful operations in three cases of acute and fresh exacerbating adnexal inflammatory tumors, the author advocates surgical intervention. The patients operated upon were all ill for a long time and were subjected to more or less intensively conservative treatment and the laparotomy was done as a last resort. The generally accepted rule of operating only during an interval of the chronic stage and in the subacute stage was disregarded. Although it is often possible to relieve fresh or recurring adnexal tumor cases with conservative measures within four to six weeks, nevertheless there is no anatomical restitution; the pus in the tubes may become inspissated and shrinkage may result, but the adhesions with the resulting displacement of the uterus remain, only to give renewed trouble later on, even though there may be no acute exacerbation. The conservative treatment with terpichin failed in the hands of the author and even aggravated the condition, so that operation had to be done eventually as a lifesaving measure. The social aspect should also be given consideration so that the quickest results may be obtained.

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Treatment of Sterility in the Female.—Erwin Graff (*Wiener klinische Wochenschrift*, January 25, 1923) thinks that the examination of the semen from the vagina is preferable to the usual condom method. Primary sterility usually shows hypoplasia of the sex organs, for which mechanical therapy (dilatation of the cervical canal) has been replaced by etiological therapy. This condition may be evidenced merely by irregular menstruation. Menstrual disturbances that indicate ovarian disturbances are relieved by röntgen therapy and ovarian therapy. Sterility may be caused by posterior displacements of the uterus, though their influence is largely overestimated. Inflammatory conditions in the genitals require treatment and the determination whether the tubes are patent is important. Gonorrhea frequently causes sterility. If the patency of the tube is established by Rubin's test, operation is indicated. Conservative treatment very often suffices to bring about pregnancy. The author is a believer in the theory of an immunity against semen and he does not consider dyspareunia a bar to sterility.

Significance of Varicocele in Women.—Gotthard Schubert (*Zentralblatt für Gynäkologie*, October 14, 1922) considers varicocele of the broad ligament as a disease which may produce severe symptoms. Any treatment other than operation is useless. Only operative treatment comes up for consideration in the majority of the cases, inasmuch as the true cause, or the seat of the trouble, is only truly recognized at the time of the laparotomy. The technic of the operation should be individualized according to the nature of the case. The author considers the extirpation of the dilated plexus of veins in the mesosalpinx as entirely adequate for the extirpation of the superior parovarian varicocele. The removal of the internal genitals, together with the removal of the body of the uterus, should be reserved for only the most severe cases, inasmuch as the symptoms of artificial menopause, which may ensue, are just as unpleasant as the condition itself. Even the leaving of one ovary does not always protect against the symptoms of the artificial menopause, as the author saw some very severe symptoms following the vaginal extirpation of the uterus, even though both ovaries were left behind. Among thirty cases, the operations gave very satisfactory results in all but four.

Therapeutic and Prophylactic Injection Around the Nipple with Quinine.—Hans Kritzler (*Zentralblatt für Gynäkologie*, May 20, 1922) reports a case of unusually severe inflammation of the nipple, resulting from fissures during the puerperium. Both nipples were as large as half a prune, showing deeply penetrating, ugly looking, fissured ulcerations. The breasts were not infected. The condition failed to respond to every form of treatment and was excruciatingly painful. The author then tried nipple anesthesia with 0.5 per cent. quinine dihydrochloride carbamide, injecting the right nipple subcutaneously outside of the areola and around the left areola intracutaneously in the form of a wheal, so as to determine whether the intracutaneous or the subcutaneous nerves were responsible for the pain. On the left side the surface anesthesia was complete, whereas it was incomplete on the right side; the left side still showed deep seated pain, but the subareolar area on the right side was absolutely painless. Within twelve to twenty-four hours the swelling of both nipples receded entirely, showing a regular form and size, with the ulcerated areas completely united. The improvement from day to day was miraculous. Cauterization with ten per cent. silver nitrate solution was repeated once and the woman was discharged after four days. After another four days, the fissures were painless, almost cured, and the nipples appeared normal. The inflammatory condition was undoubtedly influenced by the disinfecting action of the quinine. The advantages of the nipple anesthesia with quinine are: 1, its simplicity; 2, the relief from excruciating pain, especially in nervous women; 3, it aids in the cure of the socalled paradoxic hypogalactia; 4, it prevents psychogenetic hypogalactia; 5, it aids milk production and secretion; 6, it favors the prevention of mastitis.

Relationship of Iodine Therapy of Arteriosclerosis to the Clinical and Pathological Aspects of This Disease.—After a careful analysis of the pathological anatomy and the clinical study of arteriosclerosis as well as the hemodynamic effect of the iodine, J. Wiesel (*Wiener klinische Wochenschrift*, April 9, 1923) comes to the conclusion that the iodine treatment has a particular effect on all the manifold phenomena underlying this process. If improvement in the condition is possible, it is due to the particular peculiarities of the disease process. In this way the cerebral arteriosclerosis is favorably influenced because the disease process in the cerebral vessels completely resembles that of syphilitic endarteritis. Improvement is to be expected to just as great an extent in arteriosclerosis which is produced by hyperthyroidism. The byeffects of the iodine in some patients must be warned against as these are frequently mistaken for signs of progressive arteriosclerosis, such as emaciation.

Effect of Camphor on the Lactating Breast.—J. Rosenblatt (*Zentralblatt für Gynäkologie*, September 21, 1922) reports that the administration of camphor inhibits the secretion of milk in the lactating breast, as would be indicated in cases of tuberculosis, decompensated heart conditions, etc., or after an infant has died and lactation is no longer necessary. Camphor is given internally for three to five days in doses of 0.12 to 0.18 gram three times a day, but subcutaneous injections of camphor produce results more quickly. The same effect may be obtained in cases of infants with lactating breasts, in which cases 0.01 to 0.02 gram camphor or compresses of camphorated oil are used. The results in a series of fifteen hundred cases were so strikingly good that all other methods of treatment have been abandoned by the author.

Indication for Ventrofixation of the Uterus.—Emil Ekstein (*Zentralblatt für Gynäkologie*, June 24, 1922) maintains that, inasmuch as the patients which he saw after having unilateral operations done on the adnexa (oophorotomy, salpingooophorectomy, extrauterine pregnancy, etc.) were suffering with a movable retroflexion of the uterus with its associated symptoms, which might have been avoided by a primary operation for the purpose of doing a profixation of the uterus, he ought to call attention to this indication for ventrofixation, more properly called profixation.

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MISCELLANY.

Heating of the Tissues of the Body by Light and Heat Rays.—Leonard Hill and J. Argyll Campbell (*Lancet,* April 14, 1923) found that: 1. Exposure of the whole body of a rabbit to the sun's rays rapidly increased the temperature of the deeper tissues, the fur temperature rising as high as 54°C. 2. Exposure of the head and upper part of the body to the sun's rays was followed by a fall of temperature in the deeper tissues, the fur temperature in the sun not exceeding 46.5°C. 3. Local exposures of the head of a rabbit to the carbon greatly increased the temperature under the scalp and in the brain, the fur temperature rising above 60°C. The body temperature (rectal) was often not greatly altered. The respiration was always rapid (over one hundred a minute). 4. Even though it is recognized that heat stroke is usually due to a general raising of the body temperature, the results show that local heating may occur, and confirm the utility of pitch helmets and spinal pads on exposure to tropical sun. 5. Using the skin of the human knee and ordinary sources of rays (carbon arc and gas radiators) it was confirmed that luminous rays heat up the subcutaneous tissues to a greater degree than do nonluminous rays, the skin temperature being the same in both cases.

Application of the Test of the Rapidity of the Sedimentation of the Erythrocytes in Gynecology.—E. Rumpf (*Zentralblatt für Gynäkologie,* July 29, 1922) draws the following conclusions regarding the value of the erythrocyte sedimentation test in gynecology: The test for the rapidity of the sedimentation of the erythrocytes is a good means of determining the most suitable time for instituting active therapeutic measures (massage, curettage, operations on the adnexa, etc.). Sedimentation values below ten mm. in one hour allow the definite exclusion of inflammatory processes and the fairly certain conclusion that virulent germs exist in pus foci. The reaction has less value in differential diagnosis, as its greatest value lies in a negative result (below ten mm. an hour) and not at the height of sedimentation. Consequently, this test is serviceable in the differentiation of inflammatory organic processes from those produced by functional conditions. A normal rapidity of sedimentation of the erythrocytes does not speak against carcinoma and carcinomatous recurrences. The sedimentation test may have a prognostic value in blood transfusions.

Blood Platelets and Menstruation.—R. Pfeiffer and Hoff (*Zentralblatt für Gynäkologie,* November 4, 1922) show that on the first day of menstruation there is an extraordinary reduction in the thrombocytes from a half to a quarter and even to one fifth of the normal number. There seems to be a constant relationship between the large and small blood platelets. The number of the former increases constantly up to one or two days after the completion of menstruation. This phenomenon is explained by the fact that possibly the maturation of the ovarian follicle and formation of the corpus luteum acts on the spleen in such a manner that there is a hindrance to the extrusion of the thrombocytes from its sites of development in the bone marrow, or it may obstruct their rapid subsequent formation.

Experimental Hyperfeminism.—Josef Bondi and Rudolf Neurath (*Wiener klinische Wochenschrift,* June 8, 1922) report on their experiments, in which they implanted ovaries from nongravid donors into female rats of the same species and of the same age. Their aim was to produce a hyperfeminism but in only three out of twenty-seven cases did pregnancy result. This occurrence may possibly be explained by the fact that the uterus remains undeveloped. The authors have in mind an inhibitory effect of the changes in the transplanted ovaries upon the ovarian hormones, which also regulate the normal development of the uterus.

A Case of Adnexal Hernia.—Adolf Birmann (*Wiener klinische Wochenschrift,* June 29, 1922) reports a case in a woman who had a left sided hernia for many years which caused no inconvenience until it suddenly emerged during a defecation. It was replaced with difficulty and resulting continuous pain. After a time it emerged again and could not be replaced. After using forceful taxis, the hernia was finally reduced but caused a sudden severe pain in the left hypogastrium. The left side of the abdomen was rigid, the left inguinal ring was patent, and it contained an adherent mass. A reduction *en bloc* of the hernia was suspected and an operation under local anesthesia was undertaken. On opening the hernial sac, much blood poured forth and an inserted finger entered into a ruptured fallopian tube which contained a well preserved ovum about four weeks old. Extirpation of the tube resulted in recovery. The fallopian tube was probably pushed into the hernial ring during the act of defecation and became incarcerated there. Subsequently, the tube was ruptured by the forced taxis, resulting in hemorrhage into the peritoneal cavity and severe pains. Four similar cases were found in the literature, making this the fifth.

Simple and Effective Method of Administering Anthelmintics.—W. Horsley Gannt and Paul Foreman Wiest (*Therapeutic Gazette,* July 15, 1922), describe their method to be as follows: For at least twenty-four hours before administering anthelmintics, the patient is starved or allowed nothing but tea, coffee, and bouillon. The same evening, a dose of one ounce of magnesium sulphate is given, followed in two hours by a high soap suds enema. On the following morning, a second enema is given. The duodenal tube is then inserted into the stomach, with the patient on his right side, swallowing or sipping water frequently to induce the passage of the tube to the seventy-five cm. mark. This takes from twenty to forty minutes. In order to determine whether the tube has entered the duodenum, aspiration is done when a light golden yellowish fluid appears. When the tube is in the duodenum, fifteen c.c. of the following is inserted every fifteen minutes for four doses: ten c.c. of oleoresin Aspidii in mucilage of acacia sufficient to make sixty c.c. Two hours after the last dose, one and a half ounces of magnesium sulphate is given through the tube, which is then withdrawn. If the bowels do not move within four hours, the dose of salts is repeated and a saline enema administered. The method obviates discomfort, nausea and repetition of treatment, and ensures closer contact of the anthelmintic with the head of the worm.

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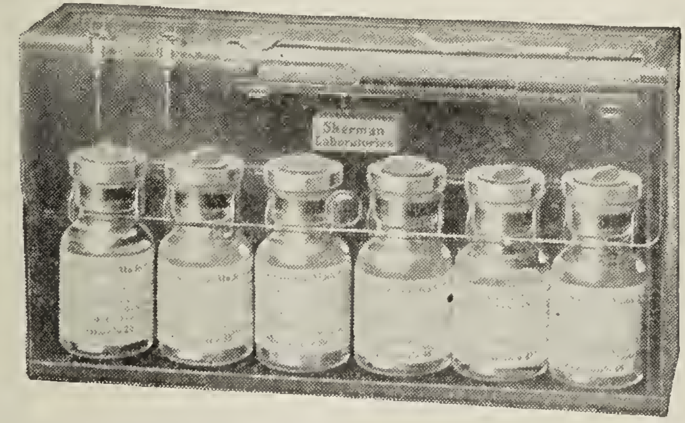

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Menorrhagias of Puberty.—L. Soler y Soto (*Revista Ibero-Americana de Ciençias Médicas*) says that menorrhagia due to a single gland is a rarity. Irregularities, like the normal functioning, of the reproductive system are under the control of a combination of endocrine glands. The thyroid body, the pituitary, and the suprarenal glands exercise an undisputed effect on the evolution and function of the genital apparatus, and it is a disturbance of their equilibrium that almost invariably causes irregular action on the part of that apparatus. The different degrees, therefore, of hyperfunction and hypofunction in one or other gland are of the greatest significance in the treatment of menorrhagia and similar conditions. Thyroid extract is appropriate in the first place for the known influence of that gland on the ovary; pituitary extract in response to important indications; hepatic extract, whose use in practice has been until now greatly limited; adrenal extract in the form of adrenalin; mammary extract, well known for its hemostatic effect; and ovarian extract. Most menorrhagias at puberty, unless due to genital displacement or to psychoneurosis, result from some blood dyscrasia; and the treatment most frequently found availing in correction of such a dyscrasia is the use of thyroid and pituitary extracts.

Peptone Immunization in Asthma and Other Allergies.—A. G. Auld (*Lancet,* April 21, 1923) states that in the clinical examination special attention should be given to the teeth, nasal cavities, tonsils, or other sources of infection; to the state of the lungs, the circulation, and digestion; to the presence of the gouty or rheumatic diathesis; and to endocrine defect. Operations for nasal affections sometimes aggravate the asthma. It is better to treat cases urgently requiring such at first, and then to wait some time before beginning the immunization. The skin tests may give valuable information. The patient usually knows what articles of diet to avoid; as the peptone treatment usually overcomes the sensitiveness to them it is often unnecessary to insist on their avoidance. The diet should be plain, very moderate, and diuresis encouraged by drinking water or soda water. In cases where dermal reactions to protein are given, the peptone acts more rapidly and often more effectually. After the constitutional symptoms have subsided, these reactions persist in the skin. Otherwise the desensitizing effect of peptone is universal and includes bacterial intoxication. Asthmatics are often highly sensitive to vaccines and the symptoms may be intensified by them. A five per cent. solution of peptone in physiological salt solution is used for intravenous injections and a seven and one half per cent. solution for intramuscular injections. They must be very carefully prepared and sterilized by heating up to 60° to 65° C. and then made faintly alkaline by soda or borax, the latter acting also as a preservative; otherwise one half of one per cent. carbolic acid is used. The injections are given slowly to avoid reactions, and are never given during the attacks. The dose is 0.3 c.c., increasing it by 0.2 c.c. up to 1.5 c.c. or more. When an attack occurs during the treatment, one must wait until recovery is complete, and then begin again with a very small dose, as the result of the attack is to produce the protective substance, antianaphylatoxin. The latter substance is also produced by a single big dose of peptone, but the protection is fleeting. On the other hand, the gradual immunization by small doses creates in addition that disorientation of the sensitized tissues toward the exciting agents which renders their attacks abortive for a longer or shorter time, according to the nature of the case.

Scientific Classification of Chronic Arthritis.—The following new nomenclature for the types of chronic arthritis is suggested by A. G. Timbrell Fisher (*British Medical Journal,* July 21, 1923): Chronic arthritis (monarticular, polyarticular); 1, synovial type (socalled rheumatoid arthritis), in which the disease commences and remains more marked in the synovial membrane, the cartilage and bone may be invaded secondarily, and every gradation may be seen between the chronic types and the more acute forms which lead to ankylosis; 2, chondroosseous type (socalled osteoarthritis), in which the disease commences and remains more marked in the articular end, the synovial membrane being involved later; 3, the mixed type, in which the disease commences simultaneously in synovial membrane and articular end and the changes advance *pari passu.* In all three types osteophytes may form at the articular margins, but in the synovial type they occur comparatively late in the disease, and in the more chronic forms which lead to ankylosis are usually absent. The suggested nomenclature is obviously only a primary classification. It is probable that further research will justify a subdivision of each type.

Influence of Sodium Salicylate Upon the Arthritis of Rabbits Inoculated With Nonhemolytic Streptococci.—Homer F. Swift and Ralph H. Boots (*Journal of Experimental Medicine,* April, 1923) inoculated rabbits with streptoccoci, giving one group sodium salicylate before the first inoculation as well as after. The animals receiving salicylates succumbed much more quickly to the streptococcus infection than did the controls. They developed almost as many inflamed joints as the untreated controls similarly inoculated. But the salicylated rabbits had a much higher proportion of mindly inflamed joints than the controls. The antiinflammatory action was most evident in animals inoculated with streptococcus of the lower virulence, and could not be demonstrated in animals inoculated with hemolytic streptococci.

Action of Sulphur.—A. Hottinger (*Schweizerische medizinische Wochenschrift,* April 26, 1923) emphasizes the following facts: 1. Sulphur is reduced to sulphuretted hydrogen in the intestine. 2. Sulphuretted hydrogen binds sulphur to the polysulphides. 3. Polysulphides, and particularly sodium polysulphides, transform themselves into each other and readily give off sulphur. 4. Biologically, sulphur acts as a hydrogen acceptor inasmuch as it reduces itself to sulphuretted hydrogen. In this way it appears to play an important part in oxidation processes in the organism, especially in the decomposition of certain acid products of metabolism. 5. Sulphuric acid forms readily from sulphuretted hydrogen under reduction of the blood hydrogen. 6. As a result, sulphur plays a double part in metaboism: as an oxidizing and a reducing substance.

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MISCELLANY.

Rickets.—Carlos Jiminez Diaz (*La Pediatria Española*, June 30, 1923) believes that this disease is due to the following factors, 1. Lack of vitamin X in the diet, and lack of radiant energy. 2. A consequent slowing of the metabolic process. 3. Increased concentration of hydrogen ions in the organic media. 4. A break in the union of calcium with the proteins of the tissues.

White Mice and the Assay of Insulin.—Donald T. Fraser (*Journal of Laboratory and Clinical Medicine*, April, 1923) found that starved mice were susceptible to the intraperitoneal injection of insulin, and that mice fed immediately after its injection are tolerant to its effect. Fraser attempted to correlate the unit as determined by the use of rabbits with the unit as determined by the use of mice; 0.0025 c. c. was found to be approximately the equivalent of five (rabbit) units per c. c.

Complications of Labor.—Ogden F. Conkey (*Archives of Pediatrics*, April, 1923) concludes that the importance of hemorrhagic disease in the etiology of cerebral hemorrhage in the newborn has been exaggerated. Most intracranial hemorrhages are the result of trauma and can be explained satisfactorily by the mechanical features of labor. A better understanding and more skilful handling of the complications of labor will result in fewer birth injuries and hemorrhagic lesions of the brain.

Varicocele of the Broad Ligament.—R. Jahreiss in Augsburg (*Zentralblatt für Gynäkologie*, May 20, 1922) reports a case, which he diagnosed as a beginning tubal abortion. A consultant diagnosed the condition as a varicocele of the left broad ligament, but this diagnosis was not confirmed by an operation as the patient recovered spontaneously. After two years, the same patient presented a right tubal pregnancy with rupture, which resulted in a large retrouterine hematocele, from which she also recovered without operation.

Management of Diabetes Mellitus.—Charles W. McGavran (*Ohio State Medical Journal*, September 1, 1923) advocates a campaign against obesity, which according to Joslin is a large etiological factor in diabetes. A sugar tolerance test should be made on every obese patient; whether there be any diabetic findings or not the obese patient should be told of his danger and taught how to reduce. The sugar tolerance test should be repeated every six or twelve months. Insulin, while not curative, makes it possible for the severe diabetic to live but it in no way supplants dietetic treatment.

Significance of the Female Generative Organs in Renal Diabetes.—Heinz Küstner (*Zentralblatt für Gynäkologie*, July 29, 1922) finds that the excretion of sugar during pregnancy, with low blood sugar values (renal diabetes), is not the result of the impregnation of an ovum or of fetal metabolic changes, but it rather depends upon the function of the ovaries, especially the corpus luteum, which seems to be the exciting factor. This assumption is substantiated also by the fact that a renal glycosuria may occur in the premenstrual stage, that is, at the time of the existence of the corpus luteum. If these facts are borne in mind, renal diabetes may be considered as an early sign of pregnancy.

Stethoscopic and Röntgenographic Diagnosis of Pulmonary Tuberculosis in Adults.—John Tillman (*Hygiea*, June 15, 1923) reports observations on 300 patients in the Orup Sanatorium, the next largest tuberculosis hospital in Sweden. In twenty-five per cent. of the cases he finds fair agreement between the stethoscopic and the röntgen findings, whereas the röntgenogram gave a better result than the clinical diagnosis in 175 cases out of 243, and stethoscopy surpassed the röntgen diagnosis in only six cases. The author considers the röntgen procedure an extremely valuable auxiliary method which should be employed as often as possible.

Toxicity of Cocaine.—Ellison L. Ross (*Journal of Laboratory and Clinical Medicine*, July, 1923) undertook this work to determine whether adrenalin is an antidote for cocaine poisoning or a substance increasing its toxicity, using cats as subjects, and varying the rate of introduction of cocaine hydrochloride into the chloretoned animals. As the rate of introduction of cocaine increased the minimal lethal dose of cocaine first decreased and then gradually increased up to the end of the series. The conclusions reached are that the minimum lethal dose for cats varies with the rate of administration of cocaine; the absolute minimum lethal dose of cocaine hydrochloride for chloretoned cats is .0128 grams to the kilo of body weight, and that adrenalin markedly increases the toxity of cocaine.

Lipoids of Maternal and Fetal Blood at Conclusion of Labor.—J. Morris Slemons and Henricus J. Stander (*Bulletin of the Johns Hopkins Hospital*, January, 1923) in order to secure information regarding the activity of the placenta, which links the nutritional processes of mother and fetus, obtained and analyzed specimens from each simultaneously. A comparison of the two shows that the mother's blood contains much more fat, lecithin and cholesterol than does the fetal blood. The human placenta is impenetrable to fat and lipoids. Fetal fat must be synthesized from some material, probably glucose, which passes readily through the placenta, and is supplied by the mother in quantities proportionate to the demands of the fetus. No characteristic change in the blood fat or blood lipoids was found to accompany the development of eclampsia and allied intoxications of pregnancy.

Absence of Vagina and Hematometra With Unusual Operation.—C. D. Josephson (*Svenska Läkaresällskapots Förhandlingar* June 30, 1923) reports the case of a girl of fifteen who had menstrual molimina without flow, and investigation showed complete absence of vagina and above the symphysis pubis a large globular tumor, the uterus distended by accumulated menstrual fluid. This he remedied by making a suprapubic incision into the uterus, evacuating the contents and attaching the opened uterus to the abdominal wall, thus establishing a fistulous opening as exit for the menstrual flux, his object being to leave the patient in the possession of such genitalia as she had; and with entire satisfaction to the patient apparently, for throughout the eleven years that had passed since the operation the periodical functioning through the new channel was in no way disturbing to her. In spite of her infirmity the woman had contracted gonorrhœa during this period.

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Pathogenicity of Streptococci From Diphtheria Throats for Mice.—Louis Brody and Lloyd Arnold (*Journal of Laboratory and Clinical Medicine*, March, 1923) state that streptococci isolated from the throats of diphtheria patients do not seem to be pathogenic for white mice. Only two of twenty hemolytic strains tested showed virulence for the mice. The two strains had a limiting pH concentration of 4.7 and 4.6 respectively, being halfway between the pathogenic or human and the nonpathogenic or bovine type in this respect. The twenty viridans strains with a limiting pH of 4.2 to 5.0 were not pathogenic for mice. Streptococci from normal throats, the hemolytic strains giving a limiting pH concentration within the human or pathogenic range, were used as controls. These were also nonpathogenic for mice. The authors were unable to find any relation between the limiting pH concentration and the pathogenicity for mice.

Essential Factors in the Treatment of Intestinal Obstruction.—Thomas G. Orr and Russell L. Haden (*Journal of the Missouri State Medical Association*, October, 1923) emphasize the following points. 1. In treating acute intestinal obstructions, the mechanical obstruction, dehydration, starvation and toxemia should be emphasized as the four phases of the pathological process. 2. The mechanical obstruction should be relieved as soon as possible but the other three phases should be carefully considered in conjunction with its relief. 3. Dehydration should be overcome by the administration of three thousand c.c. or more of liquid every twenty-four hours during the acute illness. 4. The starvation should be met with the administration of sufficient glucose to produce a caloric value equal to or in excess of 1680 a day, which is the minimum for an adult of seventy kilos at rest. This may be given in the vein, under the skin and by rectum. 5. The toxemia which is the most important factor of the disease, may be combatted by giving sodium chloride in sufficient quantity to maintain the chlorides of the blood and urine at a normal level.

Posterior Gravity Drainage in Empyema: The Strategic Seat of Election.—In relating his experiences with posterior gravity drainage, John O'Connor (*British Medical Journal*, May 5, 1923), states that: 1. Drainage at the posterior inferior pleural angle is aided by gravity. Not a drop of pent up pus ever followed the removal of a wisp of silkworm gut for the purpose of changing or cleansing the same, even when the forcible cough test has been applied in the sitting or other posture. The dressings were continuously impregnated with discharge until the sinus closed. These two factors constitute socalled free dependent drainage. 2. The lung in all cases first expanded downward along the axillary wall, and invariably commenced its beneficent work by obliterating the outer segment of the cavity; from thence gradually continued its downward and inward expansion until the remaining sinus, which always passed inward toward the spine, was occluded. 3. A wisp of silkworm gut, while maintaining perfect drainage, does not cause any necrosis or pyogenic lining along its track irrespective of the one retained in situ. 4. The excision of rib may be an unnecessary adjunct when posterior gravity drainage is provided.

Action of Fibrolysin in Scleroderma and Dupuytren's Disease.—G. Tognini (*Revista Critica di Clinica Medica*, Florence, April 25, 1922), has found that the only contraindications to the use of fibrolysin are grave cardiac or renal lesions or tuberculosis. This drug is the sodiosalicylate of thiosinamin, and it is given intramuscularly in doses of two to three c.c. of a ten per cent. solution, two to four times a week. Both scleroderma and Dupuytren's disease showed distinct improvement under the use of fibrolysin in Tognini's hands.

Treatment of Essential Hemophilia With Maternal Serum.—Rezende Puech (*Annæs Paulistas de Medicina e Cirugia*, September-October, 1921), insists that true familial or essential hemophilia should not be confounded with temporary or symptomatic hemophilia or the hemorrhages of the newborn. He affirms that the intravenous administration of maternal blood serum is the best and most rational treatment of essential or true hemophilia. It is a method devoid of danger as it effectively prevents hemophilic accidents. Its action is both prophylactic and curative, and it can be given over long periods to obtain a definite cure.

Effect of Substances Having Hyperpyretic Action on the Fever Curve.—Paul Saxl (*Wiener klinische Wochenschrift*, April 9, 1923), asserts that chills can be produced by the intravenous injection in man by albuminous and nonalbuminous substances, whereas certain substances like serum, calcium chloride and others do not produce chills. By means of these artificial chills, every febrile curve may be interrupted without necessarily producing collapse. Both the artificial chill and that resulting from disease may be followed by either a high rise or a fall of the fever. If a hyperthermia is produced artificially (as with the injection of milk) without a chill, the subsequent fall in the febrile course is considerably slower, as compared with the rapid fall following a chill. In the septic chill there usually results a rise of temperature without any subsequent rapid fall. Intramuscular injections produce a less severe chill and therefore act more slowly.

Congenital Hypertrophy of the Pylorus.—One hundred and fifty-six children out of a series of two hundred and twenty-five with congenital hypertrophy of the pylorus observed by George F. Still (*British Medical Journal*, April 7, 1923) recovered and sixty-nine died. Operation is not necessary in every case, as is shown by the infants in whom the tumor and peristalsis gradually disappeared, and after weeks and even months of hovering on the verge of collapse, recovered completely without any special treatment except careful regulation and reduction of the diet. Of seventy-eight infants who were treated only by lavage, forty-three recovered and thirty-five died. The author believes that he is justified in retaining this method of treatment in certain cases. If the infant is breast fed, it is best to resort to operation immediately, so that the breast feeding may be continued with an interruption of only forty-eight hours. Of one hundred and eight infants treated by forcible dilatation, eighty-six showed good results; twenty-two infants of this group died. The Rammstedt operation was successful in eighteen out of twenty-nine cases. The author's favorite procedure is dilatation.

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No. 12

New York Medical Journal
AND
MEDICAL RECORD

A SEMIMONTHLY
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DECEMBER NINETEENTH
1923

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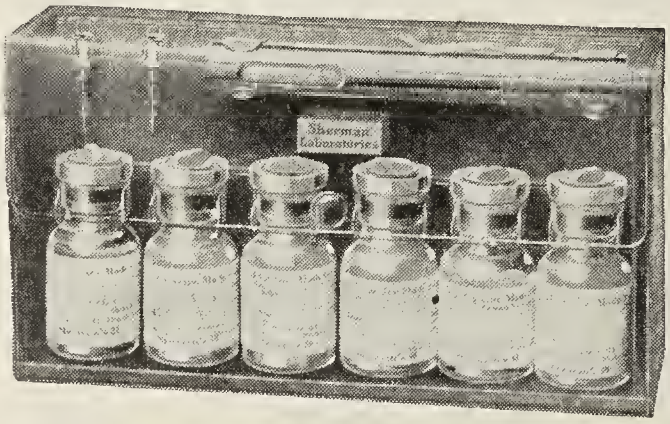

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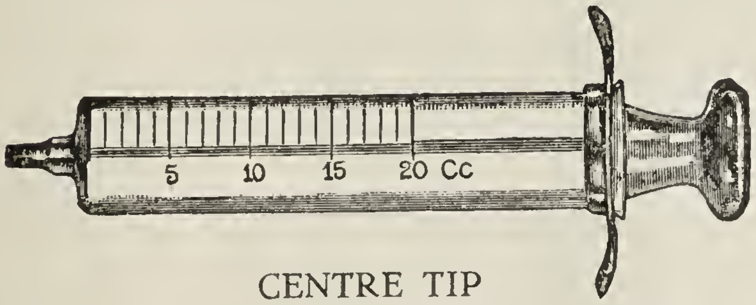

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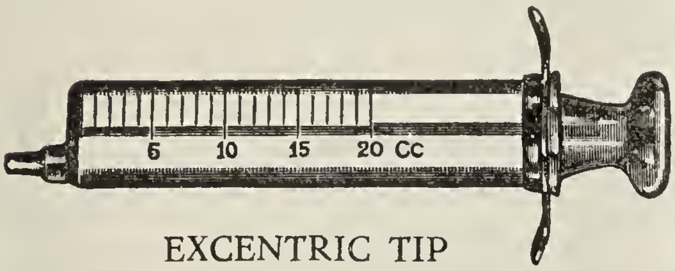

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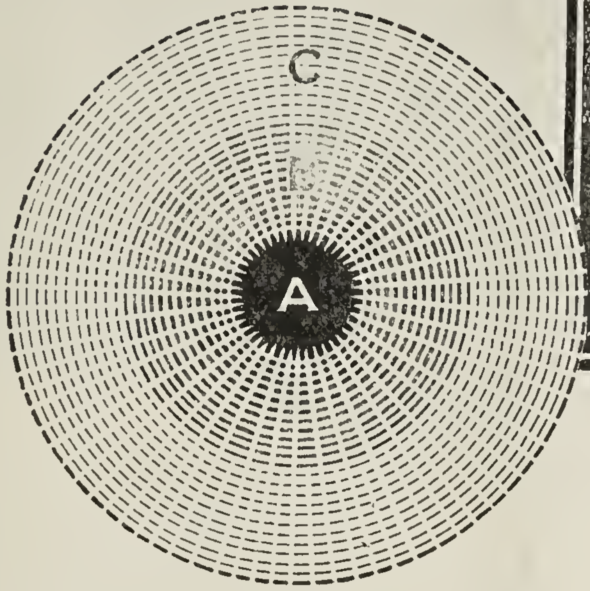

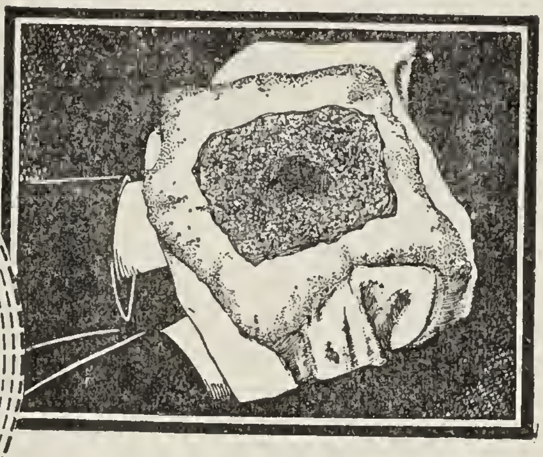

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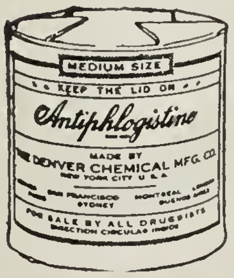

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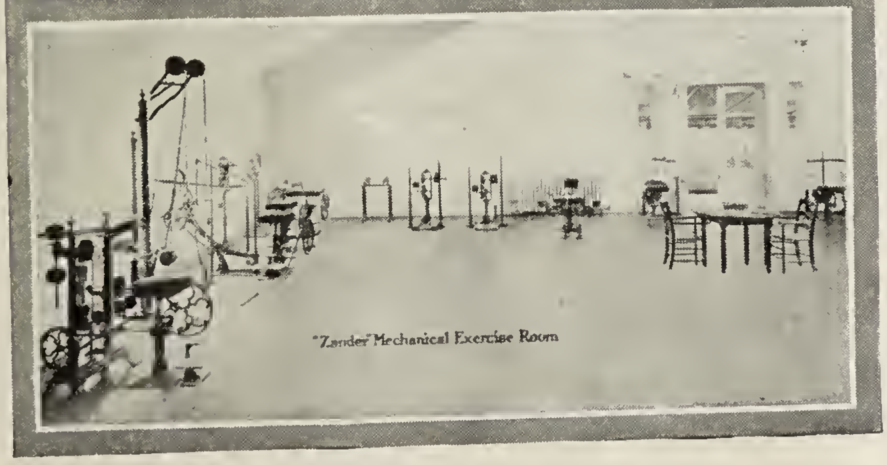

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Tredgold—Mental Deficiency—$6.00.

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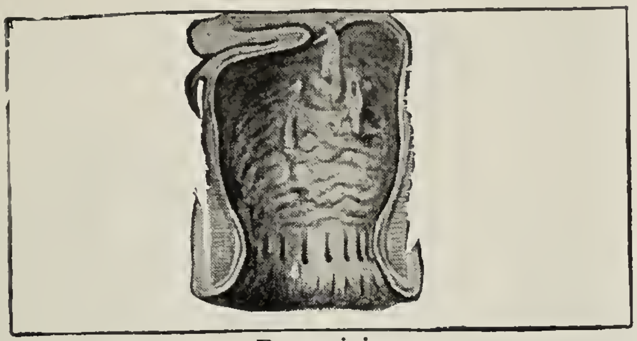
Chapin and Pisek—Textbook of Diseases of Children, Fourth edition—$4.50.
Kelynack—Defective Children, Second edition—$4.00.
Von Reuss—Diseases of the New-Born—$12.50.

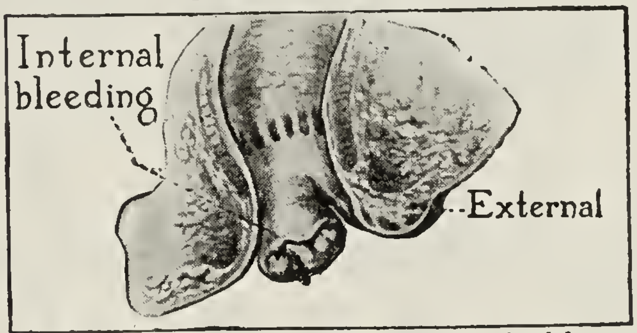
William Wood & Company, 51 Fifth Avenue, New York



Proctitis

Fissure of anus

Cryptitis (focus of infection)



Internal and external hemorrhoids.

LUBRICATION THERAPEUSIS
IN RECTAL AND ANAL PATHOLOGY

PROCTITIS: According to a noted proctologist, inflammation of the rectal mucosa is much more common than is generally thought. The indications for treatment are to produce a soft evacuation and to lubricate and soothe the bowel wall. Nujol accomplishes this and also reduces the time during which the fecal mass is held in contact with the inflamed mucosa, thus quickening the healing of the membrane.

FISSURE: The dry, hard feces when forced over the delicate mucous membrane of the anal canal cause it to erode, leaving an open wound. Nujol softens the feces and lubricates the intestine. Thus it prevents fissure formation or encourages healing by preventing irritation and infection.

HEMORRHOIDS: Rectal inflammation and fecal impactions prevent the proper flow of venous blood into the portal circulation. This is accentuated by the absence of valves in the rectal veins and man's upright position, but particularly by straining at stool. Nujol, by its softening, lubricating action, enables the feces to be evacuated without straining. Thus, by removing one of the conditions which causes and aggravates hemorrhoids, Nujol brings comfort and relief to the patient, often leading to ultimate disappearance of the trouble.

CRYPTITIS: A frequently overlooked cause of painful defecation and a source of systemic infection. The hard fecal lumps are kept soft by the regular administration of Nujol. Nujol also forms a lubricating coat over the crypt, thus favoring healing and relieving the pain.

Nujol, the ideal lubricant, is the *therapeutic common denominator* of all types of constipation. Microscopic examinations show that too high a viscosity fails to permeate hardened scybala. Too low a viscosity tends to produce seepage. Exhaustive clinical tests show the viscosity of Nujol to be physiologically correct and in accord with the opinion of leading medical authorities.

Nujol

Guaranteed by NUJOL LABORATORIES, STANDARD OIL CO. (NEW JERSEY)

COMBINES the delightful qualities of effervescence with the well-known digestive properties of Peptenzyme.

The powerful and effective action of Peptenzyme, supplemented with the tonic and refreshing effects of effervescence, thus insures both

PERMANENT BENEFIT AND PROMPT RELIEF

in gastralgia, nervous and fermentative dyspepsia, flatulence, atonic indigestion, and to relieve the gaseous fermentation that usually causes so much discomfort in digestive disorders.

It is palatable to the nth degree and gives the physician a cooling and refreshing beverage, free from any hint of medicine, yet pregnant with therapeutic value.

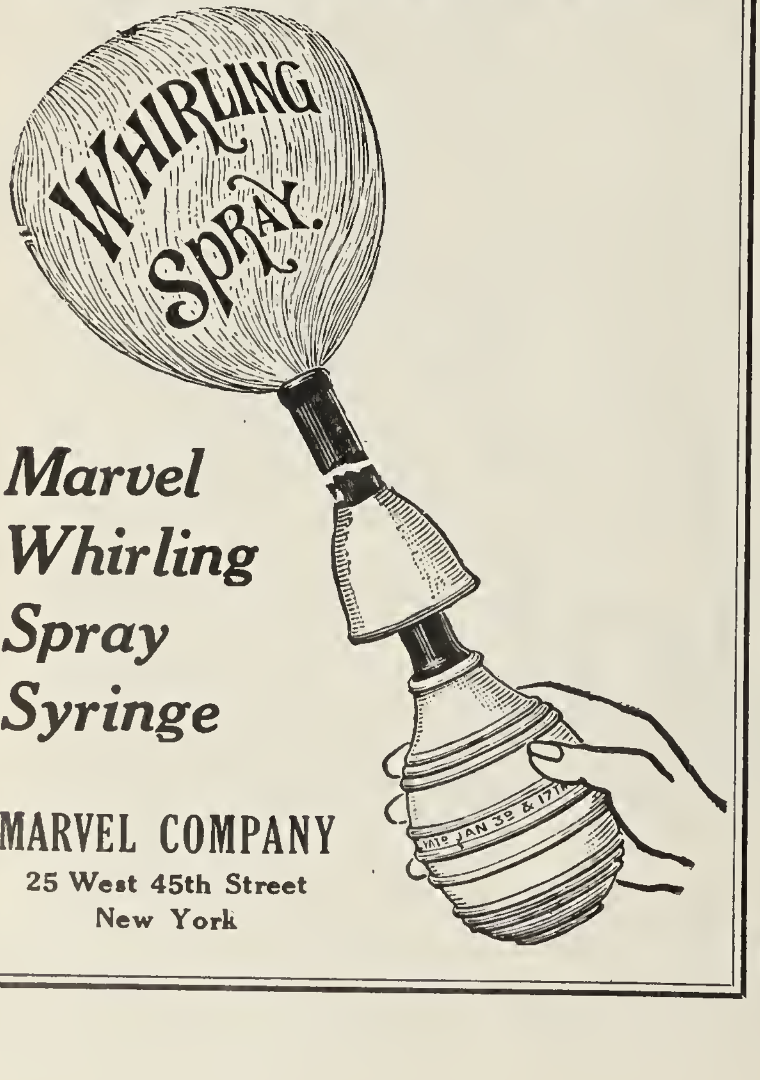
Converts the Distresses of Indigestion into a Smile

SOMETHING NEW

PEPTENZYME EFFERVESCENT GRANULES

REED & CARNRICK
JERSEY CITY, N.J.

RECOMMEND



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Your Patients' Pain
can be relieved by

PHENALGIN

First — Promptly and effectually.
Second — Without the least danger of causing a drug habit.
Third — No special blanks are needed in prescribing Phenalgin, and no special records have to be kept.

Phenalgin in the great majority of cases makes the opiates, with all their dangers and inconvenience unnecessary.

Its constantly increasing use since its introduction over a quarter of a century ago is the logical result of its efficiency as a pain reliever.

Samples and literature on request

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PHENALGIN
NEW YORK
GEO C COOK & CO

New Remedies for Gonorrhea

GONOSAN
"RIEDEL"

come and go, but GONOSAN, a scientific combination of the purest East Indian Sandalwood Oil and Kava-Kava Resins, retains its predominant place with the medical profession as the most efficient balsamic in the treatment of inflammatory conditions of the genito-urinary tract.

Prescribe GONOSAN for acute and chronic cases.

Samples are at your disposal.

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The Body's Second Line of Defense

the adrenal system—is invariably weakened by infections such as influenza, pneumonia, bronchitis, and colds. The result is adrenal insufficiency, asthenia, subnormal circulation, poor elimination, and low blood-pressure. The adrenal system

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supplying it with the chemical principle which it has spent so freely in combating the infection. Adrenal support is as rational a form of organotherapy as the use of thyroid in myxedema.

Adreno-Spermin Co. (Harrower)

contains the elements which the adrenal glands need. It has proved its inestimable usefulness particularly following influenza.

Sig. 1 q. i. d. at meals and upon retiring.

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Malnutrition, Marasmus, Infantile Atrophy, Athrepsia

Mellin's Food	**8 level tablespoonfuls**
Skimmed Milk (1% fat)	**9 fluidounces**
Water	**15 fluidounces**

This mixture contains 56.61 grams of carbohydrates, thus supplying material that is utilized rapidly for heat and energy. The predominating carbohydrate is MALTOSE, which has the highest point of assimilation of any of the sugars, is immediately available as fuel and may be safely given in comparatively large amounts. The daily intake of protein from the employment of this formula is 15.54 grams, an amount calculated to be sufficient to replace depleted tissues and to provide for new growth. There is present in the mixture 4.32 grams of salts for replenishing inorganic elements.

The suggested modification furnishes nutrition in keeping with the character and amount of food elements best adapted to the particular demands of infants in an extreme state of emaciation and serves well as a starting point in attempting to meet the nutritive requirements of these undernourished babies.

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PROTARGOL

In acute and chronic gonorrhea Protargol is considered by many urologists an essential feature in the routine treatment. Acute cases respond quickly to weak solutions, which are well borne and economical.

ALYPIN

For local anesthesia of the genito-urinary tract in cystoscopy, instrumentation and operative work, Alypin has proved safe, prompt and efficient.

HELMITOL

Where an internal urinary antiseptic is required, as in cystitis, pyelitis and urethritis, Helmitol has been found to be agreeable of administration, excellently tolerated and satisfactory in effect.

Literature on Request

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WINTHROP PRODUCTS
Conform to Original BAYER High Standards

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LISTERINE

A Non-Poisonous, Unirritating, Antiseptic Solution

Agreeable and satisfactory alike to the Physician, Surgeon, Nurse and Patient. Listerine has a wide field of usefulness and its unvarying quality assures like results under like conditions.

As a wash and dressing for wounds
As a deodorizing, antiseptic lotion
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Operative or accidental wounds heal rapidly under a Listerine dressing, as its action does not interfere with the natural reparative processes.

The freedom of Listerine from possibility of poisonous effect is a distinct advantage, and especially so when the preparation is prescribed for employment in the home.

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NEOSALVARSAN

The practitioner who employs Neosalvarsan is reinforced in his judgment by more than 12 years of carefully controlled clinical experience. In the manufacture of American Neosalvarsan we have faithfully preserved the processes leading to the production of the original Ehrlich "914," unsurpassed in therapeutic potency.

The lowered prices of this therapeutic sufficiency herewith appended show our mindfulness of our obligations to the profession and the public.

0.15 gram	$ .60 per ampule	0.6 gram	$ .80 per ampule
0.3 gram	.65 per ampule	0.75 gram	.90 per ampule
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SULPHARSPHENAMINE

Sulpharsphenamine, one of the earlier Ehrlich arsenicals, intended for intramuscular use, is manufactured by us. Prices range from 50 cents per ampule for 0.05 gram size to 80 cents per ampule for the 0.6 gram size.

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It is important that each form of cough be treated according to its origin and effect, and as a reliable guide to the physician, we suggest the following time tried preparations.

BECHOL, an elixir white pine compound, especially indicated in coughs resulting from bronchial and laryngeal conditions.

CANNABIS COMP., most useful in persistent coughs, resulting in restlessness and high nervous tension.

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MENTHYPHEN, especially efficacious in diseases of the respiratory organs, and of specific value in coughs due to aggravated catarrhal conditions.

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THE WM. S. MERRELL COMPANY
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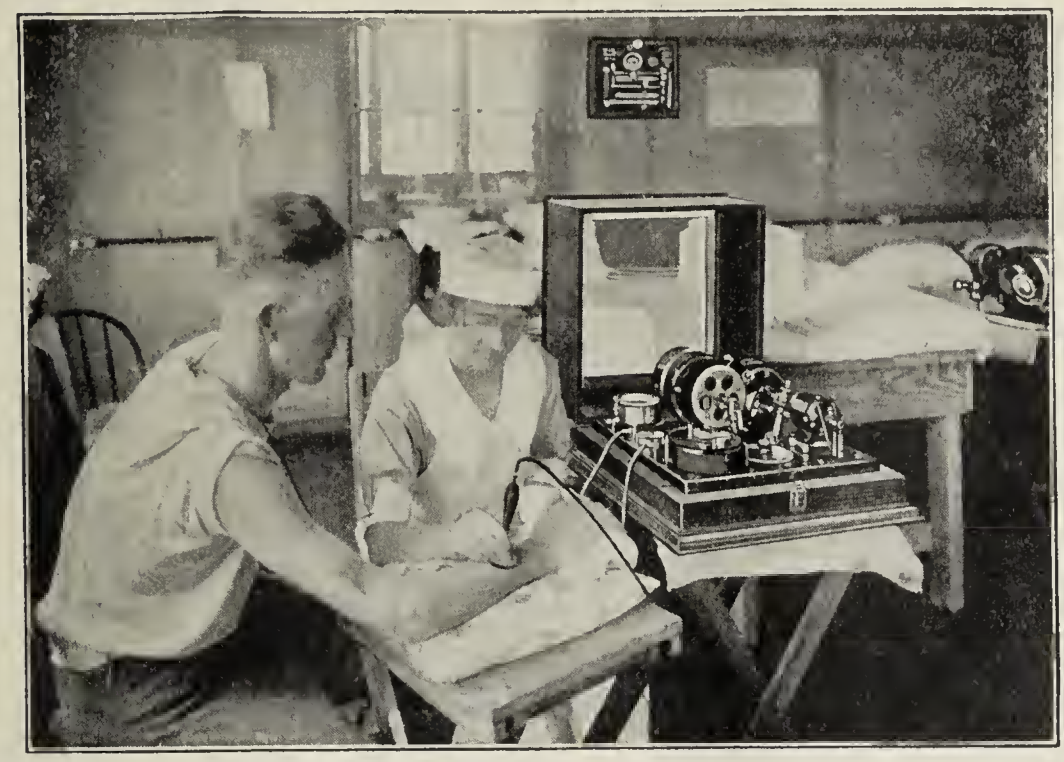
FOR THE TREATMENT OF PERIPHERAL NERVE INJURIES

And for Testing for the Reaction of Degeneration



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For technique see P 148 Waggoner's "Note Book of an Electro-Therapist" (price $5.00), or chapter 17, Sampson's "Physiotherapy Technique" (price $6.50).

The Polysine gives ten forms of Galvanic and Sinusoidal currents. It affords splendid results in Intestinal Stasis and chronic constipation, and has a wide field of usefulness in many other conditions.

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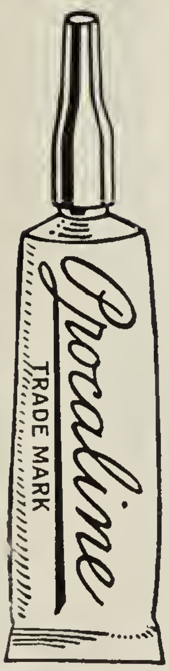

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We could not improve the product so we improved the package. Our new tube is non-metallic Hyguloid with a soluble tip. Absolutely safe and effective. The tubes are wrapped in wax paper and enclosed in glassine envelopes. They are packed 3 in a box to fit the vest pocket.

PROCALINE is safe, non-irritating, easy to use and efficient.

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For sale by all druggists. Physicians can dispense or prescribe it with confidence. It does just what you expect.

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furnishes the absorbable organically combined iron
that encourages the construction of red cells.
The red cells include the Hemoglobin—
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The hematin combines with the iron—
The iron carries the oxygen—
The oxygen stimulates the waste and repair
that constitutes life and living.

It is thus of unquestioned value in ANEMIC, CHLOROTIC and DEVITALIZED CONDITIONS.

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CAMPHO-PHENIQUE rules among its kind because it is superior to them in actual searching tests. As a germicide CAMPHO-PHENIQUE is positive in effect, economical and uniform in action.

As a first aid dressing CAMPHO-PHENIQUE is the logical choice, owing to its continuous germicidal action and anodyne effect.

The properties possesed by Campho-Phenique make it the ideal dressing for all surgical wounds. It prevents infection and hastens healing.

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Samples mailed on request.

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IMPROVEMENT OF DIPHTHERIA ANTITOXIN

NOTWITHSTANDING the vast fund of experience and information which has been gained through the many years in which Diphtheria Antitoxin has become established in medical practice, our knowledge is nevertheless steadily increasing and improvements continue to be made in the method of manufacture.

In the early days of serum therapy the standardization of antitoxin was a haphazard proposition, and even the tests utilized for safeguarding its purity left much to be desired. All that is a thing of the past. The standardization of antitoxin is now a definite and accurately controlled procedure, so that its potency, as expressed in antitoxic units, is a certain guide to the physician in determining dosage. Thoroughly dependable tests for insuring the freedom of the product from bacterial contamination or toxic substances of whatever nature have also been developed.

During recent years research effort has largely been directed toward increasing the concentration of antitoxin —getting the therapeutic dose in a smaller bulk and eliminating unnecessary solid material, especially proteins. An antitoxin thus refined has obvious advantages. The smaller quantity is easier for the physician to inject and less painful to the patient. Even more important, however, is the elimination of unnecessary albuminous substances which in certain patients may cause protein toxemia.

It is now possible, by methods of chemical precipitation, to so concentrate diphtheria antitoxin as to make a given volume many times as potent as the same amount of serum freshly separated from the blood of the treated horse. This is accomplished by precipitating the serum globulin, a constituent of the serum with which the antitoxic element is closely identified. Various methods of carrying out this concentration have been developed, the results of which vary—not only in the degree of the concentration, but also in the physical characteristics of the antitoxin thus obtained. It is very important that the concentration be effected without increasing the viscosity of the globulin to a degree sufficient to delay absorption when administered to the patient. Absorption is an important factor in the clinical response to antitoxin, whether the injections are given subcutaneously or intramuscularly; and delay in absorption is obviously a serious disadvantage.

The methods employed in the biological laboratory of Parke, Davis & Co. furnish a practical solution to this problem. The resultant antitoxin has a high concentration, a low content of protein in comparison with its unit strength, and on injection is absorbed with great rapidity.

To safeguard the potency of the product, every lot contains 40 per cent excess units at the date of issue—more than enough to insure the full labeled potency within the period of use for which it is dated.

Five sets of purity tests are carried out with every lot of antitoxin, to preclude the possibility of any contamination of the serum.

The development and rigid enforcement of these methods has given to the medical profession an antitoxin of high excellence, the purity and dependability of which are beyond all question.

PARKE, DAVIS & COMPANY
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AMENORRHEA

DYSMENORRHEA

MENORRHAGIA

usually respond to treatment with

HORMOTONE

which acts directly through the endocrine apparatus concerned in the menstruation process.

Dose: 1 or 2 tablets three times daily.

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Sluggish Bowel Action in Childhood

is usually due to errors in feeding. Subjecting these fundamentals to the customary careful correction,

INTEROL

may be administered coincidentally to relieve the immediate condition.

This pure, tasteless and odorless mineral oil—notably free from the greasiness common to such products—has proved of exceptional value as a safe and dependable means of moving the bowels of young children, and this without the griping, straining and after-constipation by which the use of castor oil and other drastic cathartics is so frequently attended.

The constantly-growing number of physicians who prefer INTEROL to any other media in the routine management of constipation in early life is its own best endorsement.

Dosage in Children

Begin with a half to one teaspoonful, 3 times a day before meals. Increase or decrease dose until one good movement is obtained daily. Then gradually decrease to the point where a small dose at bedtime will maintain this result.

Sample and Interol brochure on request.

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MANUFACTURERS OF ORASEPTINE—Internal and External Antiseptic, Wash, Spray and Douche.

ADACCO SALT—Effervescent Saline Laxative and Uric Acid Solvent.

VELOGEN—"The Doctor's Hand-maid and Household Emollient."

Break the Vicious Circle in Hemorrhoids
Anusol Hemorrhoidal Suppositories
Schering & Glatz, Inc
Original

—That is precisely what

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do and why for over a quarter of a century they have remained the standard and most widely prescribed remedy for the relief and treatment of Hemorrhoids and the rectal disturbances leading up to Hemorrhoids.

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The name of the Spring is on the cap
THERMAL ESTABLISHMENT OF VICHY
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The place of CÉLESTINS Vichy in the dietary is distinctive and important. It is an alkaline water of diuretic action, and is indicated in cases of the following:

Chronic hepatic disorders; gastric and intestinal indigestions; acid dyspepsia; chronic catarrhal gastritis or enteritis; rheumatism; diabetes; inflammation of the bladder; and a large number of minor ailments.

CÉLESTINS VICHY is bottled only at Vichy, France, under the direct supervision of the French Government. Order and insist upon getting CÉLESTINS VICHY.

A booklet on the therapeutic uses of CÉLESTINS Vichy will be sent on request.

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Winter Coughs

Respond promptly to

ANGIER'S EMULSION

The proven efficacy of Angier's Emulsion in cases of WINTER COUGHS and BRONCHIAL AFFECTIONS warrants its use in your practice. It is particularly useful for elderly people and children because it is pleasant to take and causes no digestive disturbance.

"If you are not familiar with the Emulsion and you have a case where you would like to try some samples, we will send them charges prepaid on request."

ANGIER CHEMICAL CO.
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HAYDEN'S VIBURNUM COMPOUND

supplies those anti-spasmodic, astringent, diuretic, tonic and normalizing properties which for years have made it indispensable for the medical treatment of gynecological disorders.

DYSMENORRHOEA
UTERINE or OVARIAN COLIC
MENORRHAGIA
CLIMACTERIC NEUROSES

In teaspoonful doses in hot water t. i. d

LITERATURE, SAMPLE, ETC., ON REQUEST.

NEW YORK PHARMACEUTICAL COMPANY
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In Arthritic and Gouty Disorders HAYDEN'S URIC SOLVENT has for years enjoyed leadership.

To the Thoughtful Physician

NEITHER artificial flavoring nor adulteration is needed to add to the fragrance of the natural Turkish tobacco, for there is no roughness to disguise. Melachrino cigarettes are entirely free from dust, and because they are bland and gentle to the throat and lungs may be smoked freely without harmful effects. The smoker of Melachrino cigarettes enjoys the purest and most delicate tobacco in the world.

ORIGINAL

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"The One Cigarette Sold the World Over"

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Tonsilitis and Laryngitis

During this season of the year the physician is often called upon to prescribe a remedy for throat infection. We suggest you use **BORO-FORMALIN,** a powerful non-toxic, non-irritant, antiseptic solution.

As a gargle or spray diluted with 5 parts of water, it destroys the micro-organisms that find a lodging place in the mucous membrane of the larynx and pharynx. It may also be used by applying it direct to the parts affected by means of the cotton applicator.

BORO-FORMALIN is composed of Boro-Salicylic Glycerole, Benzo-Resorcinol, Menthol, Thymol, Eucalyptol and 2 pro mille of Formalin. It is miscible with water, alcohol or glycerin in any proportion, has a pleasant aromatic odor and a pungent taste.

We suggest you give it a trial in your next case of Tonsilitis, Laryngitis or Pharyngitis. You will be pleased with the result. A sample is yours for the asking.

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O'SULLIVAN'S SAFETY CUSHION HEEL

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labor under conditions which impose a constant tax on the nervous and mental forces of the body. Extreme fatigue is a natural consequence, but those who wear

O'Sullivan's Heels

have learned that in thus avoiding the nervous tension caused by the harsh impacts of hard leather heels, they can greatly reduce nerve tire and exhaustion, and as a logical result do more and better work.

It is easy to understand, therefore, why so many physicians advise O'Sullivan's Heels for those who work under nerve tiring conditions.

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the production of acid substance is high. Hence the indication for Alkalies.

Anticipate a possible acidosis by using liberally

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The strongest alkaline water of commerce

Each bottle carries in sparkling form several grammes of the bicarbonates of sodium, potassium, calcium and magnesium.

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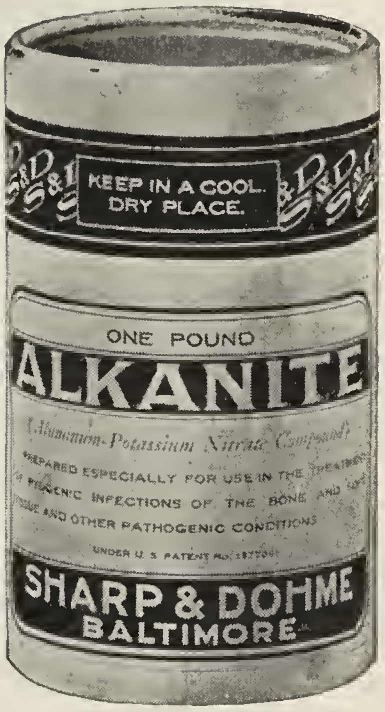
As an adjunct to good surgery "Alkanite" ranks with Dakin's

In ¼-lbs at $1.50 thru your druggist

ALKANITE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KEEP IN A COOL. DRY PLACE.
ONE POUND
ALKANITE
(Aluminum-Potassium Nitrate Compound)
PREPARED ESPECIALLY FOR USE IN THE TREATMENT OF PYOGENIC INFECTIONS OF THE BONE AND SOFT TISSUE AND OTHER PATHOGENIC CONDITIONS
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A NEW ACCURACY IN BLOOD PRESSURE READINGS

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So gravely important are blood pressure readings successful physicians take no chances. Thousands have laid aside old instruments and adopted the Baumanometer for greater accuracy.

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Employing Nature's Immutable Law Insures Absolute Accuracy

The unfailing reliability of gravitation method made use of. The scale of every instrument individually hand calibrated, another fundamental of scientific accuracy. Cannot spill; no air-pockets. The variation of other instruments of 10 to 30 mm. impossible.

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Send just $2.00 and we will forward it to you at once. Try it. If not thoroughly satisfied return and get your money back. If perfectly satisfied, send the balance in ten monthly installments of $3.00 each; without interest—$32.00 in all complete, which is the regular cash price everywhere.

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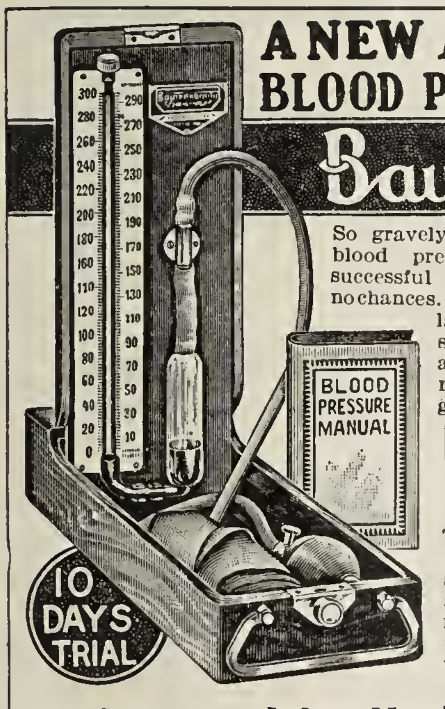
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30
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BLOOD PRESSURE MANUAL
10 DAYS TRIAL

Spasmodic Cough

Used at night vaporized Cresolene will relieve irritating cough and difficult breathing.

The cresols of coal tar as prepared in Vapo-Cresolene and vaporized, have an apparent antiseptic action in certain conditions of infected bronchii and are decidedly soothing and antispasmodic.

This has been demonstrated in the more than forty years since Cresolene was introduced.

For Whooping Cough, Spasmodic Croup, Bronchitis, Bronchopneumonia and the bronchial complications of Measles and Scarlet Fever.

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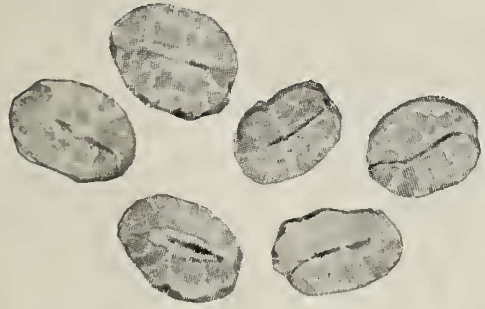

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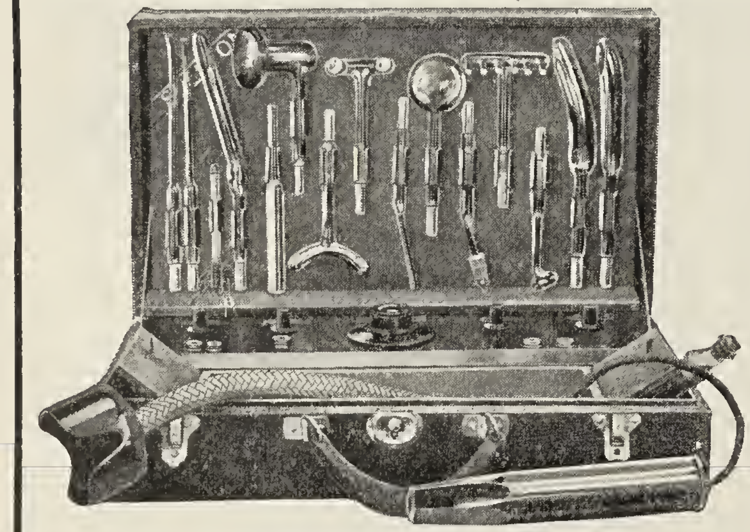

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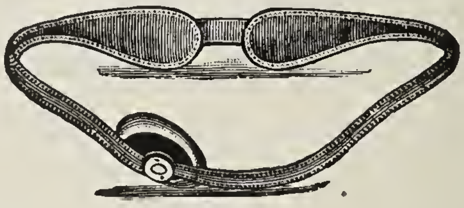

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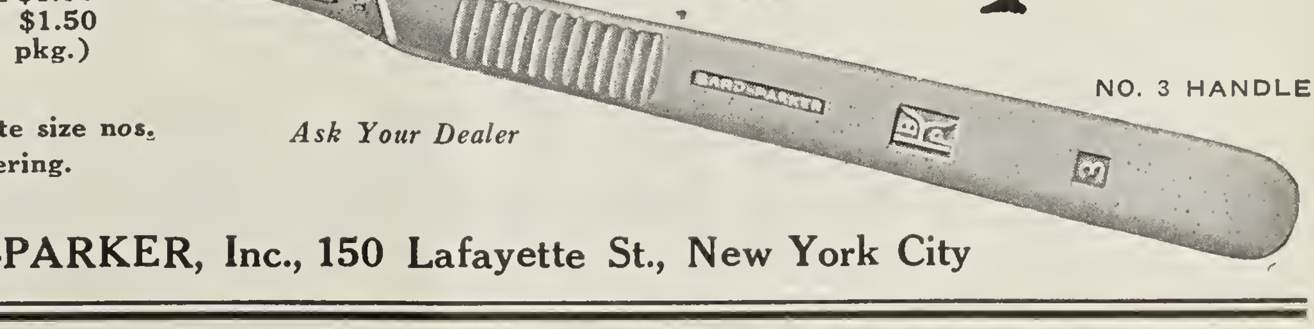
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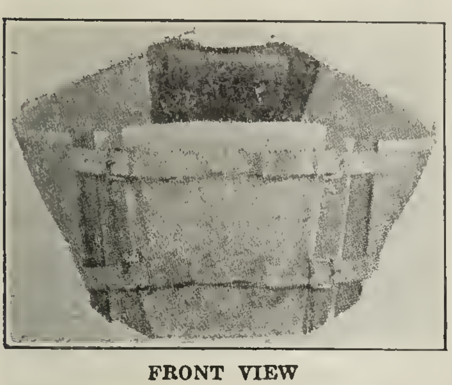

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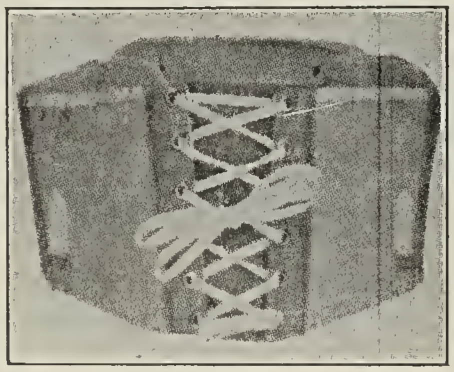

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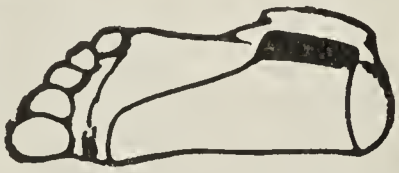

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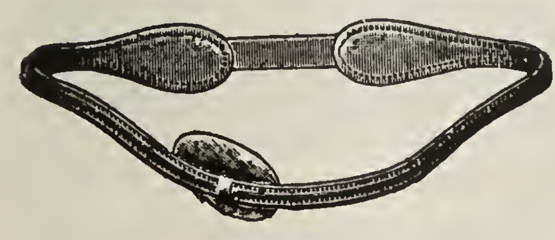

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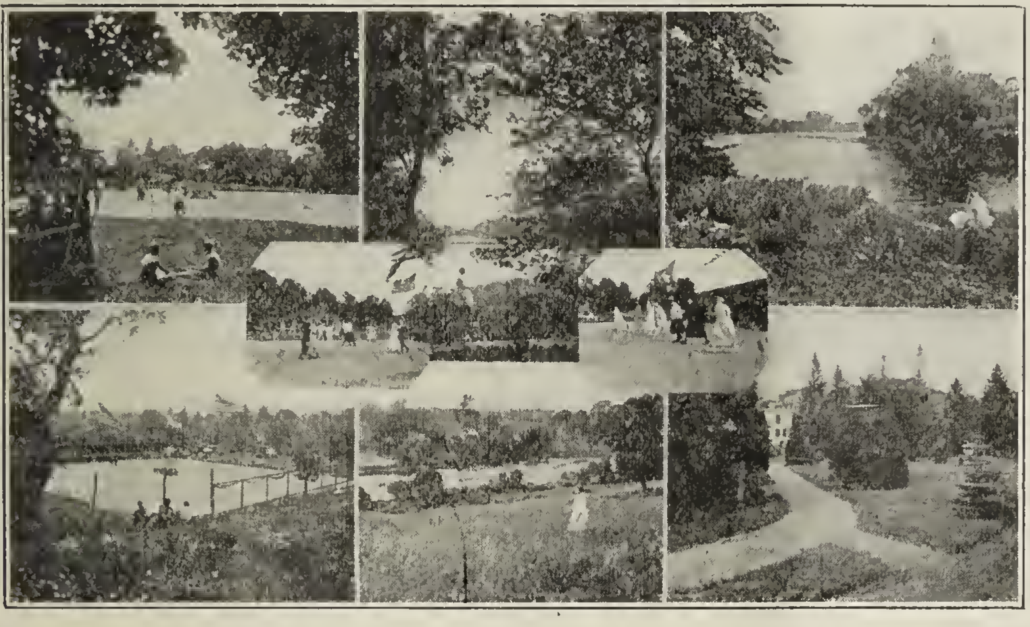

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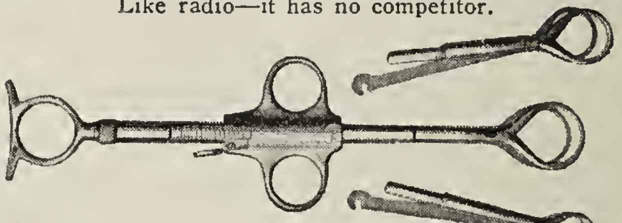

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